Model 1

Answer the following questions :

1 Complete the following :

1 If $2^{x+3} = 1$, then $x =$ .....

2 If $x + y = 4$, $x - y = 2$, then $x^2 - y^2 =$ .....

3 The solution set of the equation : $x^2 - 1 = 8$, where $x \in \mathbb{Z}^+$ is .....

4 If $2^x = 3$, then $8^{-x} =$ .....

5 $1 - \frac{3}{4} =$ ..... %

2 Choose the correct answer :

1 $\frac{5^{-2} \times \sqrt{5}}{5\sqrt{5}} =$ .....

(a) $\frac{1}{125}$ (b) $\frac{1}{25}$ (c) 25 (d) 125

2 $\mathbb{Z} - \mathbb{Z}^- =$ .....

(a) $\mathbb{Z}^+$ (b) $\mathbb{N}$ (c) $\varnothing$ (d) $\{0\}$

3 The volume of a cube of side length 3 cm. equals ..... cm^3.

(a) 9 (b) 12 (c) 27 (d) 81

4 The expression : $x^2 + k\,x + 36$ is a perfect square when k equals .....

(a) ± 6 (b) ± 8 (c) ± 12 (d) ± 18

5 A regular die is thrown once and observed the upper face, then the probability of appearance a number divisible by 3 is .....

(a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{3}{4}$

6 If $\left(\frac{5}{3}\right)^x = \frac{27}{125}$, then $x =$ .....

(a) -5 (b) -3 (c) 3 (d) 5

3 Factorize each of the following expressions :

1 $x^2 + 8x + 15$ 2 $2x^2 + 7x + 3$ 3 $x^3 - 1$ 4 $a\,x - 7\,a + 3\,x - 21$

4 [a] Simplify to the simplest form : $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

[b] Find the S.S. for the following equation where $x \in \mathbb{R}$: $x^2 - 8x + 12 = 0$

5 [a] A bag contains a number of similar balls , 5 of them are white and the rest are red. If the probability of drawing a red ball is $\frac{2}{3}$, find the number of all the balls.

[b] If $3^x = 27$, $4^{x+y} = 1$, **find the values of :** x and y

Model 2

Answer the following questions :

1 Complete the following :

1 If $7^{x-1} = 3^{x-1}$, then $x =$ .....

2 $x^3 -$ ..... $= (x-2)$ (..... $+ 2x + 4$)

3 $(5x - 2y)(25x^2 + 10xy + 4y^2) =$ .....

4 If $\frac{2x}{5} = 6$, then $x =$ .....

5 A bag contains 9 cards labeled by numbers from 1 to 9 , a card is drawn randomly , then the probability that the card carries an odd number is .....

---

2 Choose the correct answer :

1 If $x^3 y^{-3} = 8$, then $\frac{y}{x} =$ .....

(a) 8 (b) $\frac{1}{8}$ (c) $\frac{1}{2}$ (d) 2

2 The expression : $x^2 + 4x + a$ is a perfect square when a equals .....

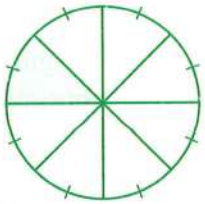
(a) 3 (b) 4 (c) 8 (d) 16

3 The S.S. of the equation : $x^2 - x = 0$ is ..... where $x \in \mathbb{R}$

(a) $\{0\}$ (b) $\varnothing$ (c) $\{0 , 1\}$ (d) $\{1\}$

4 **In the figure opposite :**

The shaded region represents ..... the circle.



(a) $\frac{1}{8}$ (b) $\frac{1}{6}$

(c) $\frac{1}{4}$ (d) $\frac{1}{3}$

5 If $3^x + 3^x + 3^x = 1$, then $x =$ .....

(a) -1 (b) 0 (c) $\frac{1}{3}$ (d) 1

6 If $6^x = 11$, then $6^{x+1} =$ .....

(a) 12 (b) 22 (c) 66 (d) 72

---

3 Factorize each of the following :

1 $4x^2 - 9$ 2 $x^3 + 8$

3 $x^2 - 5x$ 4 $x^2 - x - 6$

---

4 [a] Find in $\mathbb{R}$ the S.S. of the following equation : $x^2 - x - 6 = 0$

[b] Simplify to the simplest form : $\frac{(\sqrt{2})^5 \times 3^{-2}}{3 \times (\sqrt{2})^9}$

5 **[a]** If $\frac{2^{x} \times 3^{x}}{(12)^{x}} = \frac{1}{2}$, find the value of x

[b] A bag contains a number of similar balls. Some of them are red, 2 green , 4 blue.
If the probability of drawing a ball with green colour is $\frac{1}{6}$, find the number of red balls.

Model for the merge students

Answer the following questions :

1 **Choose the correct answer from those given :**

1 The solution set of the equation : $x^2 + 25 = 0$ in $\mathbb{R}$ is .....

(a) $\{-5, 5\}$ (b) $\{5\}$ (c) $\{-5\}$ (d) $\varnothing$

2 If the expression : $x^2 + a\,x + 9$ is a perfect square , then a = ...

(a) 3 (b) 6 (c) 9 (d) 18

3 If $(x - 1)$ is one factor of the expression : $x^2 - 4x + 3$, then the other factor is .....

(a) $x + 3$ (b) $x + 1$ (c) $x - 3$ (d) $x - y$

4 If $\left(\frac{5}{3}\right)^{x} = \left(\frac{3}{5}\right)^{2}$, then x = ...

(a) -2 (b) 2 (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$

5 The probability of the sure event equals .....

(a) 0 (b) $\frac{1}{2}$ (c) 1 (d) 2

2 **Join from the column (A) to the suitable in the column (B) :**

Column (A)	Column (B)
1 If $a^2 - b^2 = 15$, $a + b = 3$, then $a - b$ = ...	• 5
2 If one digit of the number 37450 is chosen at random , then the probability of the chosen number is even = ...	• 6 • $\frac{2}{5}$
3 If $(x + 3y)^2 = x^2 + k\,xy + 9y^2$, then k = ...	• 0
4 $4^3 + 4^3 + 4^3 + 4^3$ = ...	• 4^4
5 The probability of the impossible event = ...	

3 Complete each of the following :

1 $x^2 - y^2 = (\ldots\ldots - \ldots\ldots)(\ldots\ldots + \ldots\ldots)$

2 $x^3 - 8 = (\ldots\ldots - \ldots\ldots)(x^2 + 2x + \ldots\ldots)$

3 $x^2 - 5x + 6 = (x - \ldots\ldots)(\ldots\ldots - 3)$

4 $(a + b)x + (a + b)y = (a + \ldots\ldots)(\ldots\ldots + \ldots\ldots)$

4 Put (✔) for the correct statement and (✘) for the incorrect one :

1 A school has 320 pupils , if the probability of the chosen pupil is a boy is 0.6 , then the number of girls is 120 ( )

2 If $3^x = 27$, then $x = \frac{1}{3}$ ( )

3 A card is drawn at random , from cards numbered from 1 to 10 , then the probability that the card carries an odd number greater than 3 is $\frac{3}{10}$ ( )

4 The positive real number which if its square is added to its three times , the result will be 28 is 4 ( )

5 The solution set of the equation : $x(x - 3)(x + 5) = 0$ in $\mathbb{R}$ is $\{0 , 3 , -5\}$ ( )

5 Complete the solution in which the expression : $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$ in its simplest form :

$$\frac{(2^{\ldots\ldots})^n \times (\ldots\ldots \times 3)^{2n}}{2^{4n} \times 3^{2n}} = \frac{2^{\ldots\ldots} \times \ldots\ldots^{2n} \times 3^{2n}}{2^{4n} \times 3^{2n}}$$

$$= 2^{\ldots\ldots + 2n - \ldots\ldots} \times 3^{2n \ldots\ldots}$$

$$= 2^{\ldots\ldots} \times 3^{\ldots\ldots}$$

$$= \ldots\ldots$$

2023

Some Schools Examinations on Algebra and Statistics

1 Cairo Governorate

El-Nozha Zone
Math Supervision

Answer the following questions :

1 Choose the correct answer :

1 $\sqrt{25 \times 9}$ = ...

(a) 7 (b) 15 (c) 16 (d) 225

2 The probability of the impossible event equals .....

(a) 1 (b) – 1 (c) zero (d) 0.5

3 If $2^{x} = 3$, then 8^{x} = ...

(a) 3 (b) 9 (c) 27 (d) 81

4 If $x^2 - y^2 = 12$, $x + y = 4$, then $x - y$ = ...

(a) 3 (b) 16 (c) 8 (d) 2

5 The expression : $4x^2 + kx + 9$ is a perfect square , when k = ...

(a) ± 6 (b) 6 (c) ± 12 (d) 12

---

2 Complete :

1 x^3 – ..... = $(x - 2)$ (..... + $2x + 4$)

2 Quarter of the number 4^{20} = ...

3 The multiplicative inverse of 2^{-3} = ...

4 $\left(-\sqrt{3}\right)^{\text{zero}}$ = ...

5 If $\left(\frac{7}{3}\right)^{x} = \left(\frac{3}{7}\right)^{3}$, then x = ...

---

3 Factorize each of the following :

1 $x^2 - 81$

2 $ax - 7a + 3x - 21$

3 $8x^3 + 1$

4 $2x^2 - x - 15$

---

4 [a] Find in $\mathbb{R}$ the S.S. of the equation : $x^2 - x = 12$

[b] Simplify to the simplest form : $\dfrac{\left(\sqrt{3}\right)^{5} \times 2^{3}}{2 \times \left(\sqrt{3}\right)^{7}}$

5 **[a]** If $3^{x-2} = 81$, **find :** the value of x

[b] A bag contains a number of similar balls , 4 red balls , 6 white balls and 5 green balls. A ball is drawn randomly.

Find the probability of the drawn ball is :

[1] Red. [2] Not green. [3] White.

2 Cairo Governorate

El-Zeiton Zone
Talaea Gaber El-Ansary Language School

Answer the following questions :

1 **Complete :**

[1] If $3^{x-4} = 1$, then $x =$ .....

[2] The S.S. of $x^2 - 25 = 0$ in $\mathbb{R}$ is .....

[3] If the probability of success of a student is 0.7 , then the probability of his failure is .....

[4] If $3^x = 27$, then $x =$ .....

[5] The probability of the impossible event is .....

2 **Choose :**

[1] The S.S. of $x^2 - 3x = 0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\varnothing$ (c) $\{0 , 3\}$ (d) $\{3\}$

[2] If $\left(\frac{5}{3}\right)^x = \left(\frac{3}{5}\right)^2$, then $x =$ .....

(a) -2 (b) 2 (c) $\frac{1}{2}$ (d) $\frac{-1}{2}$

[3] If $x^2 + 8x + a$ is a perfect square , then a = ...

(a) -4 (b) 4 (c) 8 (d) 16

[4] If the age of Ali now is x years , then his age 3 years ago is ..... years.

(a) $x + 3$ (b) $3x$ (c) $x - 3$ (d) $6x$

[5] $3^3 + 3^3 + 3^3 =$ .....

(a) 3^3 (b) 3^4 (c) 3^{12} (d) 3^{81}

3 **[a]** If $\frac{8^x \times 9^x}{18^x} = 64$, **find :** x

[b] **Find in $\mathbb{R}$ the S.S. of the equation :** $x^2 - 1 = 8$

4 **Factorize each of the following :**

1 $4x^2 - 9$ 2 $x^3 + 8$

3 $x^2 - x - 6$ 4 $a x - 7a + 3x - 21$

---

5 **[a]** A box contains 2 red balls , 3 white balls and 5 blue balls. A ball is drawn randomly.

Find the probability of getting :

1 A white ball. 2 A non red ball.

3 A yellow ball. 4 A red or blue ball.

[b] If $3^{x-4} = 9$, find the S.S. in $\mathbb{R}$

3 Giza Governorate — Inspection of Math

Answer the following questions :

1 **Choose the correct answer :**

1 The expression : $x^2 + k x + 36$ is a perfect square when k = ...

(a) ± 6 (b) ± 8 (c) ± 12 (d) ± 18

2 If $7^{x+2} = 1$, then x = ...

(a) 1 (b) -2 (c) 2 (d) 7

3 If a regular die is tossed once , then the probability of appearing an even number equals .....

(a) $\frac{1}{2}$ (b) $\frac{1}{6}$ (c) $\frac{5}{6}$ (d) 0

4 $3^2 \times 2^2$ = ...

(a) 5^2 (b) 5^4 (c) 6^4 (d) 6^2

5 If $\frac{a}{b} = 1$, then $3a - 3b$ = ...

(a) zero (b) 1 (c) 4 (d) 8

---

2 **Complete the following :**

1 $(a - 3)(a - 2)$ = ... $- 5a +$ .....

2 If $3^{x-1} = 27$, then x = ...

3 If a coin is thrown once , then the probability of appearing a tail equals .....

4 $x(y - z) + m(y - z) = (y - z)$ (.....)

5 The S.S. of the equation : $x^2 + 3x = 0$ in $\mathbb{R}$ is .....

3 **[a] Factorize each of the following :**

[1] $x^2 - 4y^2$ [2] $x^3 + 8$

[b] Simplify : $\frac{4^x \times 9^x}{6^{2x}}$

---

4 **[a] Find in $\mathbb{R}$ the S.S. of the equation :** $x^2 + x = 6$

[b] Factorize each of the following :

[1] $x^2 + 14x + 49$ [2] $ax - 7a + 3x - 21$

---

5 **[a]** If the probability of choosing a boy from a class of 40 students is 0.6 , find the number of girls in this class.

[b] If $x^3 y^{-3} = 8$, **find :** $\frac{x}{y}$

4 Giza Governorate — 6th October Directorate

Answer the following questions :

1 **Complete :**

[1] The probability of the impossible event is .....

[2] The S.S. of the equation : $x^2 + 1 = 0$ in $\mathbb{R}$ is .....

[3] $\left(\sqrt{5}\right)^3 \div 5\sqrt{5} =$ .....

[4] If $3^x = 5$, then $(27)^x =$ .....

[5] The age of a man now is x years , then his age 7 years ago is ..... years.

---

2 **Choose the correct answer :**

[1] Fifth of 5^{20} is .....

(a) 5^{15} (b) 5^{10} (c) 5^{19} (d) 5^{40}

[2] $\mathbb{R}^+ \cap \mathbb{R}^- =$ .....

(a) 0 (b) $\varnothing$ (c) $\{0\}$ (d) $\mathbb{R}$

[3] If $x^2 + kx + 25$ is a perfect square , then k = ...

(a) 5 (b) 10 (c) ± 10 (d) ± 5

[4] If $x^3 + 27 = (x + 3)(x^2 + k + 9)$, then k = ...

(a) $-6x$ (b) $-3x$ (c) $3x$ (d) $6x$

[5] If $7^{x-3} = 5^{x-3}$, then $x =$ .....

(a) 5 (b) 7 (c) 3 (d) 0

3 **[a] Factorize each of the following :**

[1] $x^2 - 16$ [2] $5x + 10y + ax + 2ay$

[3] $x^4 + 4y^4$

[b] A real number if you add it to its square , the result is 12 , find the number.

---

4 **[a] Find the S.S. of the equation in $\mathbb{R}$:**

[1] $3x^2 + 15x - 18 = 0$ [2] $x^3 - 9x = 0$

[b] If $\frac{9^x \times 3^{2x}}{27^x} = 9$, **find :** the value of x

---

5 **[a] Simplify :** $\frac{4^x \times 6^{2x}}{2^{2x} \times 3^{2x}}$ and find the value when $x = 2$

[b] A box contains 5 white , 2 red , 3 green balls. One ball is drawn randomly from the box.
Calculate the probability of each of the following :

[1] The ball is white. [2] The ball is not red.

5 Alexandria Governorate — East Educational Zone Math Supervision

Answer the following questions :

1 **Choose the correct answer :**

[1] The expression : $x^2 + 6x + k$ is a perfect square when k = ...

(a) 3 (b) 6 (c) 9 (d) 36

[2] $2^2 \times 5^2$ = ...

(a) 10^2 (b) 10^3 (c) 10^5 (d) 10^6

[3] $\frac{3}{4}$ = ... %

(a) 50 (b) 25 (c) 100 (d) 75

[4] If $5^{x-2} = 1$, then x = ...

(a) zero (b) 1 (c) 2 (d) 5

[5] $(x + 3)(x - 3)$ = ...

(a) $x^2 - 3$ (b) $x^2 - 9$ (c) $x^2 + 9$ (d) $x + 3$

---

2 **Complete :**

[1] If $a + b = 4$, $a - b = 3$, then $a^2 - b^2$ = ...

2 $5^{-3} =$ .....

3 If $\frac{3}{5} = \frac{15}{x}$, then $x =$ .....

4 The S.S. of the equation : $x^2 + 5 = 0$ in $\mathbb{R}$ is .....

5 If $\left(\frac{5}{3}\right)^x = \frac{27}{125}$, then $x =$ .....

3 **[a] Factorize :**

1 $2x^2 + 7x + 3$ 2 $x^3 - 8$

[b] Simplify to the simplest form : $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

4 **[a] Find the S.S. for each of the following where $x \in \mathbb{R}$:**

1 $x^2 - 8x + 12 = 0$ 2 $9x^2 - 16 = 0$

[b] If $x = 3$, $y = \sqrt{2}$, **find in the simplest form the value of :**

1 $x^{-2} y^{-4}$ 2 $\left(\frac{x}{y}\right)^{-1}$

5 **[a] Find the value of x if :** $\left(\frac{2}{5}\right)^{2x-1} = \frac{8}{125}$

[b] A regular die is thrown once. **Find the probability of each of the following events :**

1 Appearance of a number divisible by 7

2 Appearance of a prime number.

6 El-Kalyoubia Governorate — Math Supervision

Answer the following questions :

1 **Choose the correct answer :**

1 If the expression : $x^2 + kx + 36$ is a perfect square , then $k =$ .....

(a) ± 6 (b) ± 8 (c) ± 12 (d) ± 18

2 If $\left(\frac{5}{3}\right)^x = \frac{27}{125}$, then $x =$ .....

(a) -5 (b) -3 (c) 3 (d) 5

3 If $x^3 - y^3 = 26$ and $x^2 + xy + y^2 = 13$, then $x - y =$ .....

(a) 2 (b) 4 (c) 12 (d) 39

4 The S.S. of the equation : $x^2 + 25 = 0$ in $\mathbb{R}$ is .....

(a) $\{5\}$ (b) $\{-5\}$ (c) $\{5, -5\}$ (d) $\varnothing$

5 If X is the additive identity element and y is the multiplicative identity element , then $2^{X} + 3^{y} =$ .....

(a) 5 (b) 4 (c) 3 (d) 2

2 Complete each of the following :

1 If $2^{X+3} = 1$, then $X =$ .....

2 If $(X + 2)$ is one of the factors of the expression : $X^2 + 7X + 10$, then the other factor is .....

3 If the age of Salma now is X years old , then her age after 3 years is ..... years old.

4 If the probability of a student succeeds is 0.6 , then the probability of his failure is .....

5 The solution set of the equation : $X(X-3)(X+5) = 0$ in $\mathbb{R}$ is .....

3 [a] Find the S.S. of the equation in $\mathbb{R}$: $X^2 - 9X + 14 = 0$

[b] Simplify to the simplest form : $\frac{9^{X+1} \times 4^{X}}{6^{2X}}$

4 Factorize each of the following perfectly :

1 $4X^2 - 25$ 2 $3X^2 - 7X - 6$

3 $aX - 7a + 3X - 21$ 4 $2X^3 + 16$

5 [a] If $2^{X-1} = 32$ and $3^{y} = \frac{1}{9}$, find : $X + y$

[b] A box has 4 red balls , 3 white balls , 5 yellow balls. If a ball is drawn randomly , calculate the probability of the ball is :

1 Red. 2 Not white.

7 El-Sharkia Governorate

Menya Al-Qamh Educational Admin.
Menya Al-Qamh Language School

Answer the following questions :

1 Choose the correct answer from those given :

1 $2^{-3} =$ .....

(a) -8 (b) $\frac{1}{2}$ (c) $\frac{1}{8}$ (d) 9

2 The solution set of the equation : $X^2 + 36 = 0$ in $\mathbb{R}$ is .....

(a) $\{6\}$ (b) $\{-6\}$ (c) $\{6, -6\}$ (d) $\varnothing$

3 $3^4 + 3^4 + 3^4 =$ .....

(a) 3^{12} (b) 3^4 (c) 3^5 (d) 3^6

4 The expression : $4x^2 + kx + 9$ is a perfect square if k = ...

(a) 2 (b) 4 (c) 8 (d) 12

5 If $3^x = 5$, then $3^{x+2} =$ .....

(a) 5 (b) 10 (c) 45 (d) 50

2 Complete each of the following :

1 If $7^x = 1$, then $x =$ .....

2 If $3^x = 7$, then $3^{-x} =$ .....

3 $3 \times 6 - 9 \div 3 =$ .....

4 If $x - y = 5$ and $x + y = 7$, then $x^2 - y^2 =$ .....

5 If the probability of a pupil succeeds is $\frac{7}{12}$, then the probability of his failure is .....

3 [a] Factorize :

1 $x^2 - 9y^2$ 2 $x^2 - 6x + 8$ 3 $3x^3 - 81$

[b] If $\left(\frac{2}{5}\right)^{x+1} = \frac{8}{125}$, **find :** the value of x

4 [a] Find in $\mathbb{R}$ the S.S. of the equation : $x^2 - 8x = -15$

[b] Find in $\mathbb{R}$ the S.S. of the equation : $5^{x-3} = 25$

5 [a] Simplify : $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

[b] A bag contains balls labeled by the numbers from 1 to 15 , if a ball is drawn at random , **find the probability of getting :**

1 An even number. 2 A number divisible by 5

3 A prime number.

8 El-Monofia Governorate

Tala Educational Administration
Mathematics Orientation

Answer the following questions :

1 Choose the correct answer from the given answers :

1 If $x + y = 3$, then $7y + 7x =$ .....

(a) 7 (b) 21 (c) 72 (d) 10

2 The multiplicative inverse of $3^{-1} =$ .....

(a) $\frac{1}{3}$ (b) -3 (c) -1 (d) 3

3 For any event $A \subset S$, then P (A) ..... [zero , 1]

(a) $\subset$ (b) $\not\subset$ (c) $\in$ (d) $\notin$

4 If $4^{x+1} = 20$, then $4^{x} =$ .....

(a) 5 (b) 4 (c) 9 (d) 24

5 If $x^2 - 2xy + y^2 = 36$, then $x - y =$ .....

(a) -6 (b) ± 6 (c) 6 (d) 8

2 Complete the following statements :

1 The probability of the impossible event equals .....

2 If $x = \sqrt{5} + 2$, then $x^2 =$ .....

3 If $x^3 + y^3 = 63$, $x + y = 9$, then $x^2 - xy + y^2 =$ .....

4 The solution set of the equation : $x^3 - 9x = 0$ is ..... (where $x \in \mathbb{R}$)

5 If $2^x = 15$, $2^y = 5$, then $2^{x-y} =$ .....

3 [a] Put in its simplest form : $\frac{3^{2x+1} \times 25^{x}}{15^{2x}}$

[b] A positive real number , if its square is added to it , the result is 12 , what is the number ?

4 [a] If $x \neq$ zero , $x + \frac{1}{x} = \sqrt{3}$, what is the value of the expression : $x^2 + \frac{1}{x^2}$?

[b] A group of cards numbered from 1 to 15. If one card is drawn at random , write the sample space and then find the probability that the number on the drawn card is :

1 A multiple of 6 2 An even prime number.

5 **[a] Factorize each of the following perfectly :**

1. $8x^4 + x$
2. $x^2 + y(x - 12y)$
3. $x^3 - 3x^2 + 6x - 18$
4. $3y^2 + 7y - 6$

[b] 1. **Find the solution set of the equation where $x \in \mathbb{R}$: $x^2 - 10x = -21$**

2. **Find the value of n where n is an integer : $4 \times 2^{n+5} = 1$**

9 El-Gharbia Governorate

The Central Math Supervision
Governmental Language Schools

Answer the following questions :

1 **Complete the following :**

1. The S.S. of : $x^2 + 25 = 0$ in $\mathbb{R}$ is .....
2. The multiplicative inverse of the number $\left(\sqrt{3}\right)^4$ is .....
3. If $(x - 5)^0 = 1$, then $x \in$ .....
4. If the perimeter of a square is m cm. , then its area is .....
5. The probability of the impossible event equals .....

2 **Choose the correct answer from those given :**

1. If $6^x = 7$, then 6^{x+1} = ...

   (a) 8 (b) 13 (c) 36 (d) 42

2. The S.S. of the equation : $x^3 + 9x = 0$ in $\mathbb{R}$ is .....

   (a) $\{0 , 3\}$ (b) $\{0\}$ (c) $\{0 , -3\}$ (d) $\{0.3 , -3\}$

3. If $x^2 - a = (x - 3)(x + 3)$, then a = ...

   (a) 3 (b) -3 (c) 9 (d) -9

4. The expression : $x^2 + x + a$ is a perfect square , when a = ...

   (a) 1 (b) 0.5 (c) 0.25 (d) 2

5. If $(x + y) = \frac{3}{5}$, then $(5x + 5y)^3$ = ...

   (a) 125 (b) 15 (c) 27 (d) 0.9

3 **[a] Simplify :** $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

[b] If the length of a rectangle is 5 cm. more than its width and its area is 36 cm^2 , find its perimeter.

4 Factorize each of the following expressions :

1 $x^2 - 9y^2$ 2 $x^3 - 3x^2 + 6x - 18$

3 $25x^2 - 30x + 9$ 4 $3x^3 - 81$

---

5 [a] If a card is chosen randomly from 10 cards numbered from 1 to 10 **, then find the probability that the number on the chosen card is :**

1 even. 2 divisible by 3 3 even prime.

[b] If $2^{x-2} = 32$ **, then find :** the value of x

10 El-Dakahlia Governorate — Maths Supervision

Answer the following questions :

1 Complete each of the following :

1 $1 - \frac{3}{4} =$ ..... %

2 The S.S. of $x^2 - 9 = 0$ in $\mathbb{R}$ is .....

3 If $6^x = 7$, then $6^{x+1} =$ .....

4 $(a - 2)(2a - 3) = 2a^2 - 7a +$ .....

5 The probability of the sure event equals .....

---

2 [a] **Factorize each of the following completely :**

1 $x^2 + 8x + 15$ 2 $2x^3 - 16$

[b] **Simplify :** $\frac{4^{x+2} \times 9^x}{6^{2x}}$

---

3 [a] **Factorize each of the following completely :**

1 $4x^2 - 25$ 2 $ax - 7a + 3x - 21$

[b] **Find the value of x in each of the following :**

1 $2^{x-2} = 16$ 2 $3^{x-5} = 7^{x-5}$

---

4 Choose the correct answer from those given :

1 The expression : $x^2 + kx + 36$ is a perfect square , when k = ...

(a) ± 6 (b) ± 8 (c) ± 12 (d) ± 18

2 If $x^3 y^{-3} = 8$, then $\frac{y}{x}$ = ...

(a) 2 (b) ± 8 (c) $\pm \frac{1}{8}$ (d) $\frac{1}{2}$

3 If $x + y = 3$, $x^2 - xy + y^2 = 5$, then $x^3 + y^3$ = ...

(a) 15 (b) 25 (c) 8 (d) 7

4 If $3^x + 3^x + 3^x = 1$, then x = ...

(a) -1 (b) 0 (c) 1 (d) 2

5 If $x^2 - m = (x - 7)(x + 7)$, then the value of m = ...

(a) 14 (b) -14 (c) 49 (d) -49

---

5 [a] Find the solution set in $\mathbb{R}$ for the equation : $x^2 - x - 6 = 0$

[b] A colored marble is drawn randomly of a box containing 13 red marbles , 17 white marbles and 20 blue marbles. **Find the probability of drawing :**

1 A white marble. 2 A red or blue marble.

11 Port Said Governorate Educational Directorate

Answer the following questions :

1 Choose the correct answer from the given ones :

1 If $(x - 3)^0 = 1$, then $x \in$ .....

(a) $\{3\}$ (b) $\{-3\}$ (c) $\mathbb{R} - \{3\}$ (d) $\mathbb{R} - \{-3\}$

2 $4^3 + 4^3 + 4^3 + 4^3 = 4$.....

(a) 2 (b) 3 (c) 4 (d) 5

3 A regular die is thrown once and the upper face is observed , then the probability of appearance a number divisible by 3 is .....

(a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{3}{4}$

4 The S.S. of : $x(x - 1) = 0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{1\}$ (c) $\{1 , -1\}$ (d) $\{0 , 1\}$

5 $\left(\sqrt{3} + \sqrt{2}\right)^9 \left(\sqrt{3} - \sqrt{2}\right)^9$ = ...

(a) 1 (b) $\sqrt{5}$ (c) $\sqrt{6}$ (d) 5

2 Complete each of the following :

1 If $(x-3)$ is one factor of the expression : x^2-4x+3 , then the other factor is .....

2 The expression : $4x^2+kx+49$ is a perfect square when k = ...

3 The probability of the certain (sure) event equals .....

4 $3x^2+10x+8=(3x+.....)(x+.....)$

5 $2^{zero}+2^{-1}-\left(\frac{-1}{\sqrt{2}}\right)^2=.....$

3 [a] Factorize each of the following completely :

1 x^2-25 2 $x^2-11x+18$

3 x^3+8 4 $xy+5y+7x+35$

[b] If $\left(\frac{2}{5}\right)^{2x-1}=\frac{125}{8}$, **find :** the value of x

4 [a] Find in $\mathbb{R}$ the S.S. of : $x^2+3x-28=0$

[b] Simplify : $\frac{\left(\sqrt{3}\right)^8\times\left(\sqrt{3}\right)^{-14}}{\left(\sqrt{3}\right)^{-4}}$

5 [a] Use factorization to get the value of : $(7.3)^2+2\times7.3\times2.7+(2.7)^2$

[b] The following table shows the evaluations of 50 students in one month :

Evaluation	Excellent	Very good	Good	Pass	Fail
Number of students	6	9	11	16	8

A student is randomly selected. **What is the probability of getting :**

1 Excellent. 2 Good. 3 Pass.

12 Kafr El-Sheikh Governorate — General Math Supervision

Answer the following questions :

1 Choose the correct answer :

1 If $2^x=5$, then $8^x=$ .....

(a) 40 (b) 10 (c) 16 (d) 125

2 If $\frac{x-2}{x+5}=0$, then $x=$ .....

(a) 2 (b) – 2 (c) 5 (d) – 5

3 If $7^{x-3} = 5^{x-3}$, then $x =$ .....

(a) 5 (b) 7 (c) 3 (d) -3

4 If the expression : $x^2 + 14x + k$ is a perfect square , then $k =$ .....

(a) 2 (b) 7 (c) 14 (d) 49

5 A fair die is thrown once , then the probability that 5 appears is .....

(a) $\frac{1}{2}$ (b) $\frac{1}{6}$ (c) $\frac{1}{3}$ (d) $\frac{5}{6}$

2 Complete :

1 If $3^x = 27$, $4^{x+y} = 1$, then $y =$ .....

2 If $x^2 - y^2 = 12$, $x - y = 3$, then $x + y =$ .....

3 The slope of the straight line which is parallel to the x-axis is .....

4 If $3^x + 3^x + 3^x = 1$, then $x =$ .....

5 The solution set of the equation : $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

3 [a] Factorize each of the following :

1 $x^2 - 5x - 24$ 2 $x^3 - 125$

3 $xy + 5y + 3x + 15$

[b] Find the solution set in $\mathbb{R}$ for : $x^2 + 12 = 7x$

4 [a] Simplify : $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

[b] Find the value of x if :

1 $\frac{8^x \times 9^x}{18^x} = 64$ 2 $3^{x-2} = \frac{1}{27}$

5 [a] Find the positive real number if added to its square the result will be 12

[b] A numbered card is selected randomly from a set of similar cards numbered from 1 to 20 , **find the probability of getting a card carrying :**

1 A number divisible by 5 2 A prime number.

13 El-Menia Governorate

Bani Mazar Administration
Al-Zahra Language School

Answer the following questions :

1 Choose the correct answer from the given ones :

1 If $3^{x} = 2$, then 3^{x+1} = ...

(a) 4 (b) 6 (c) 8 (d) 27

2 $x^2 + 10x + k$ is a perfect square when k = ...

(a) 10 (b) 25 (c) ± 10 (d) ± 25

3 The S.S. of the equation : $x^2 - 49 = 0$ in $\mathbb{R}$ is .....

(a) $\{7\}$ (b) $\{-7\}$ (c) $\{-7, 7\}$ (d) $\varnothing$

4 $4^3 + 4^3$ = ...

(a) 4^9 (b) 4^6 (c) 2^4 (d) 2^7

5 The probability of the impossible event equals .....

(a) 0 (b) $\varnothing$ (c) 1 (d) 100 %

2 Complete the following :

1 5 years from now it will be the age of a man was x years , then his age now is ..... years.

2 $\frac{1}{2}x^2 - 2 = \frac{1}{2}(x^2 - .....)$

3 A quarter of a half = ... %

4 If $7^{x-3} = 1$, then x = ...

5 If $a + b = 4$, $a - b = 5$, then $a^2 - b^2$ = ...

3 Factorize each of the following expressions :

1 $x^2 - 25$ 2 $ab + a + b + 1$

3 $x^3 + 27$ 4 $x^3 + x^2 - 12x$

4 [a] Solve the following equation in $\mathbb{R}$: $x^2 = 3x$

[b] Simplify to the simplest form : $\frac{5^{2x} \times 5^{x-1}}{5^{3x}}$

5 **[a]** If $\left(\frac{3}{2}\right)^{x-1} = \frac{8}{27}$, **then find :** the value of x

[b] A regular die is thrown once , **find :**

1 The event to get an odd prime number.

2 The probability of getting a number that is divisible by 5

14 Assiut Governorate

Administration of Distinguished & Governmental Language Schools

Answer the following questions :

1 **Choose the correct answer from those given :**

1 The solution set of the equation : $x^2 - x = 0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\varnothing$ (c) $\{0 , 1\}$ (d) $\{1\}$

2 If $x^2 + k\,x + 36$ is a perfect square , then k = ...

(a) ± 18 (b) ± 12 (c) ± 8 (d) ± 6

3 $3^x \times 3^x \times 3^x =$ .....

(a) 3^{3x} (b) 3^{x+1} (c) 3^{x+3} (d) 9^{3x}

4 If $2x^2 + c\,x - 3 = (2x - 1)(x + 3)$, then c = ...

(a) 2 (b) 4 (c) -5 (d) 5

5 If $3^x = 5$, $3^y = 4$, then $3^{x+y} =$ .....

(a) 15 (b) 20 (c) 9 (d) 1

2 **Complete the following :**

1 The probability of the certain event equals .....

2 $1 - \frac{3}{4} =$ ..... %

3 If $x^3\,y^{-3} = 8$, then $\frac{y}{x} =$ .....

4 $2 \times 6 - 8 \div 4 =$ .....

5 If $7^{x-1} = 3^{x-1}$, then $x =$ .....

3 **[a]** **Factorize each of the following :**

1 $25x^2 - y^2$ 2 $x^3 + 216$

[b] If $3^x = 27$, $4^{x+y} = 1$, **find :** the values of x and y

4 **[a] Find in $\mathbb{R}$ the solution set of the equation : $x^2 - 1 = 8$**

[b] Simplify : $\frac{4^{x+1} \times 9^{2-x}}{6^{2x}}$, then calculate its value at $x = 1$

5 **[a] Factorize :** $a y + 5x + 5y + a x$

[b] A colored marble is drawn randomly out of a box containing 12 red marbles , 18 white marbles and 20 blue marbles. **Find the probability of selecting :**

1. A white marble.
2. A red marble.
3. A yellow marble.
4. A non red marble

15 Qena Governorate

Qena Directorate of Education
Math Supervision

Answer the following questions :

1 **Complete each of the following :**

1. The simplest form of : $\left(\sqrt{3}\right)^3 \times \left(\sqrt{3}\right)^5 =$ .....
2. If $x + y = 5$ and $x - y = 3$, then $x^2 - y^2 =$ .....
3. $\left(\sqrt{7}+\sqrt{6}\right)^8 \left(\sqrt{7}-\sqrt{6}\right)^8 =$ .....
4. If $x - 6 = 0$, then $x =$ .....
5. $y^3 -$ ..... $= (y - 2)(y^2 +$ ..... $+ 4)$

2 **Choose the correct answer :**

1. The expression : $x^2 + 8x + a$ is a perfect square when a = ...

(a) -4 (b) 4 (c) 8 (d) 16

2. If the age of kamal now is x years , then his age 3 years ago was ..... years.

(a) $x + 3$ (b) $3x$ (c) $x - 3$ (d) $6x$

3. A regular die is thrown once , then the probability of appearance 7 on the upper face is .....

(a) $\frac{-5}{6}$ (b) $\frac{1}{6}$ (c) 0 (d) $\frac{5}{6}$

4. $3^3 + 3^3 + 3^3 =$ .....

(a) 3^3 (b) 3^4 (c) 3^{12} (d) 3^{81}

5 The solution set of the equation : $(x-1)^2 = 0$ in $\mathbb{R}$ is .....

(a) $\{-1\}$ (b) $\{1, -1\}$ (c) $\{1\}$ (d) $\{2\}$

---

3 Factorize each of the following expressions :

1 $9x^2 - 4$ 2 $ax - 7a + 3x - 21$

3 $x^3 - 1$

---

4 [a] Find the solution set in $\mathbb{R}$: $x^2 + 8x + 15 = 0$

[b] Find in the simplest form : $\frac{x^2 \times x^5}{x^3}$ where $x \neq 0$

---

5 [a] A numbered card is selected randomly from a set of similar cards numbered from 1 to 15

Find the probability of getting a card carrying :

1 A prime number. 2 A number divisible by 3

[b] If $2^{x-2} = 32$ **, then find :** the value of x

Answers of the schools examinations on Algebra & Statistics

1 Cairo

1 [1] (b) [2] (c) [3] (c)
[4] (a) [5] (c)

2 [1] $8 , x^2$ [2] 4^{19} [3] 8
[4] 1 [5] -3

3
[1] $(x-9)(x+9)$
[2] a $(x-7)+3(x-7)=(x-7)(a+3)$
[3] $(2x+1)(4x^2-2x+1)$
[4] $(2x+5)(x-3)$

4
[a] $\because x^2-x-12=0$ $\therefore (x-4)(x+3)=0$
$\therefore x=4$ or $x=-3$
$\therefore$ The S.S. $=\{4 , -3\}$

[b] $\dfrac{(\sqrt{3})^5\times 2^3}{2\times(\sqrt{3})^7}=(\sqrt{3})^{5-7}\times 2^{3-1}=(\sqrt{3})^{-2}\times 2^2$
$=\dfrac{2^2}{(\sqrt{3})^2}=\dfrac{4}{3}$

5
[a] $\because 3^{x-2}=3^4$ $\therefore x-2=4$
$\therefore x=6$

[b] [1] The probability of the drawn ball is red $=\dfrac{4}{15}$
[2] The probability of the drawn ball is not green
$=\dfrac{4+6}{15}=\dfrac{10}{15}=\dfrac{2}{3}$
[3] The probability of the drawn ball is white
$=\dfrac{6}{15}=\dfrac{2}{5}$

2 Cairo

1 [1] 4 [2] $\{5 , -5\}$ [3] 0.3
[4] 3 [5] zero

2 [1] (c) [2] (a) [3] (d)
[4] (c) [5] (b)

3
[a] $\because \dfrac{(2^3)^x\times(3^2)^x}{(2\times 3^2)^x}=2^6$ $\therefore \dfrac{2^{3x}\times 3^{2x}}{2^x\times 3^{2x}}=2^6$
$\therefore 2^{3x-x}=2^6$ $\therefore 2^{2x}=2^6$
$\therefore 2x=6$ $\therefore x=3$

[b] $\because x^2-1=8$ $\therefore x^2=9$
$\therefore x=3$ or $x=-3$ $\therefore$ The S.S. $=\{3 , -3\}$

4
[1] $(2x-3)(2x+3)$
[2] $(x+2)(x^2-2x+4)$
[3] $(x-3)(x+2)$
[4] a $(x-7)+3(x-7)=(x-7)(a+3)$

5
[a] [1] The probability of getting a white ball $=\dfrac{3}{10}$
[2] The probability of getting a not red ball
$=\dfrac{3+5}{10}=\dfrac{8}{10}=\dfrac{4}{5}$
[3] The probability of getting a yellow ball
$=\dfrac{0}{10}=0$
[4] The probability of getting a red or blue ball
$=\dfrac{2+5}{10}=\dfrac{7}{10}$

[b] $\because 3^{x-4}=3^2$ $\therefore x-4=2$
$\therefore x=6$ $\therefore$ The S.S. $=\{6\}$

3 Giza

1 [1] (c) [2] (b) [3] (a)
[4] (d) [5] (a)

2 [1] $a^2 , 6$ [2] 4 [3] $\dfrac{1}{2}$
[4] $x+m$ [5] $\{0 , -3\}$

3
[a] [1] $(x-2y)(x+2y)$
[2] $(x+2)(x^2-2x+4)$

[b] $\dfrac{(2^2)^x\times(3^2)^x}{(2\times 3)^{2x}}=\dfrac{2^{2x}\times 3^{2x}}{2^{2x}\times 3^{2x}}=1$

4
[a] $\because x^2+x-6=0$ $\therefore (x+3)(x-2)=0$
$\therefore x=-3$ or $x=2$
$\therefore$ The S.S. $=\{-3 , 2\}$

[b] [1] $(x+7)^2$

[2] a $(x-7)+3(x-7)=(x-7)(a+3)$

5

[a] ∵ The probability of choosing a girl

$= 1-0.6=0.4$

∴ The number of girls $= 40 \times 0.4 = 16$ girls

[b] ∵ $x^3 y^{-3}=8$ ∴ $\frac{x^3}{y^3}=2^3$

∴ $\left(\frac{x}{y}\right)^3=2^3$ ∴ $\frac{x}{y}=2$

4 Giza

1 [1] zero [2] ∅ [3] 1

[4] 125 [5] $x-7$

2 [1] (c) [2] (b) [3] (c)

[4] (b) [5] (c)

3

[a] [1] $(x-4)(x+4)$

[2] $5(x+2y)+a(x+2y)=(x+2y)(5+a)$

[3] $x^4+4x^2y^2+4y^4-4x^2y^2$

$=(x^2+2y^2)^2-4x^2y^2$

$=(x^2+2y^2+2xy)(x^2+2y^2-2xy)$

[b] Let the number be x ∴ $x+x^2=12$

∴ $x^2+x-12=0$ ∴ $(x-3)(x+4)=0$

∴ $x=3$ or $x=-4$

∴ The number is : 3 or −4

4

[a] [1] ∵ $3x^2+15x-18=0$ (Dividing by 3)

∴ $x^2+5x-6=0$

∴ $(x+6)(x-1)=0$ ∴ $x=-6$ or $x=1$

∴ The S.S. $=\{-6, 1\}$

[2] ∵ $x^3-9x=0$ ∴ $x(x^2-9)=0$

∴ $x(x-3)(x+3)=0$

∴ $x=0$ or $x=3$ or $x=-3$

∴ The S.S. $=\{0, 3, -3\}$

[b] ∵ $\frac{(3^2)^x \times 3^{2x}}{(3^3)^x}=3^2$ ∴ $\frac{3^{2x}\times 3^{2x}}{3^{3x}}=3^2$

∴ $\frac{3^{4x}}{3^{3x}}=3^2$ ∴ $3^{4x-3x}=3^2$

∴ $3^x=3^2$ ∴ $x=2$

5

[a] $\frac{(2^2)^x \times (2\times 3)^{2x}}{2^{2x}\times 3^{2x}}=\frac{2^{2x}\times 2^{2x}\times 3^{2x}}{2^{2x}\times 3^{2x}}=2^{2x}$

When $x=2$ ∴ $2^{2x}=2^{2\times 2}=2^4=16$

[b] [1] The probability of the ball is white $=\frac{5}{10}=\frac{1}{2}$

[2] The probability of the ball is not red

$=\frac{5+3}{10}=\frac{8}{10}=\frac{4}{5}$

5 Alexandria

1 [1] (c) [2] (a) [3] (d)

[4] (c) [5] (b)

2 [1] 12 [2] $\frac{1}{125}$ [3] 25

[4] ∅ [5] −3

3

[a] [1] $(2x+1)(x+3)$

[2] $(x-2)(x^2+2x+4)$

[b] $\frac{(2^2)^n\times(3\times 2)^{2n}}{2^{4n}\times 3^{2n}}=\frac{2^{2n}\times 3^{2n}\times 2^{2n}}{2^{4n}\times 3^{2n}}=\frac{2^{4n}}{2^{4n}}=1$

4

[a] [1] ∵ $x^2-8x+12=0$

∴ $(x-6)(x-2)=0$

∴ $x=6$ or $x=2$

∴ The S.S. $=\{6, 2\}$

[2] ∵ $9x^2-16=0$

∴ $(3x-4)(3x+4)=0$

∴ $x=\frac{4}{3}$ or $x=\frac{-4}{3}$

∴ The S.S. $=\left\{\frac{4}{3}, \frac{-4}{3}\right\}$

[b] [1] $x^{-2}y^{-4}=\frac{1}{x^2}\times\frac{1}{y^4}$

$=\frac{1}{(3)^2}\times\frac{1}{\left(\sqrt{2}\right)^4}=\frac{1}{9}\times\frac{1}{4}=\frac{1}{36}$

[2] $\left(\frac{x}{y}\right)^{-1}=\left(\frac{y}{x}\right)=\frac{\sqrt{2}}{3}$

5

[a] $\because \left(\frac{2}{5}\right)^{2X-1} = \frac{8}{125}$

$\therefore \left(\frac{2}{5}\right)^{2X-1} = \left(\frac{2}{5}\right)^{3}$ $\therefore 2X-1=3$

$\therefore 2X=4$ $\therefore X=2$

[b] [1] The probability of appearance of a number divisible by $7 = \frac{0}{6} =$ zero

[2] The probability of appearance of a prime number $= \frac{3}{6} = \frac{1}{2}$

6 El-Kalyoubia

1 [1] (c) [2] (b) [3] (a)
[4] (d) [5] (b)

2 [1] -3 [2] $(X+5)$ [3] $X+3$
[4] 0.4 [5] $\{0, 3, -5\}$

3

[a] $\because X^2 - 9X + 14 = 0$

$\therefore (X-2)(X-7)=0$

$\therefore X=2$ or $X=7$

$\therefore$ The S.S. $= \{2, 7\}$

[b] $\frac{(3^2)^{X+1} \times (2^2)^X}{(3\times 2)^{2X}} = \frac{3^{2X+2} \times 2^{2X}}{3^{2X} \times 2^{2X}} = 3^{2X+2-2X}$

$= 3^2 = 9$

4

[1] $(2X-5)(2X+5)$

[2] $(3X+2)(X-3)$

[3] $a(X-7)+3(X-7)=(X-7)(a+3)$

[4] $2(X+2)(X^2-2X+4)$

5

[a] $\because 2^{X-1} = 2^5$ $\therefore X-1=5$

$\therefore X=6$

, $\because 3^y = (3)^{-2}$ $\therefore y=-2$

$\therefore X+y=6-2=4$

[b] [1] The probability of the drawn ball is red $= \frac{4}{12} = \frac{1}{3}$

[2] The probability of the drawn ball is not white $= \frac{4+5}{12} = \frac{9}{12} = \frac{3}{4}$

7 El-Sharkia

1 [1] (c) [2] (d) [3] (c)
[4] (d) [5] (c)

2 [1] zero [2] $\frac{1}{7}$ [3] 15
[4] 35 [5] $\frac{5}{12}$

3

[a] [1] $(X-3y)(X+3y)$ [2] $(X-4)(X-2)$
[3] $3(X-3)(X^2+3X+9)$

[b] $\because \left(\frac{2}{5}\right)^{X+1} = \left(\frac{2}{5}\right)^{3}$ $\therefore X+1=3$

$\therefore X=2$

4

[a] $\because X^2 - 8X + 15 = 0$ $\therefore (X-5)(X-3)=0$

$\therefore X=5$ or $X=3$ $\therefore$ The S.S. $= \{5, 3\}$

[b] $\because 5^{X-3} = 5^2$ $\therefore X-3=2$

$\therefore X=5$ $\therefore$ The S.S. $= \{5\}$

5

[a] $\frac{(2^2)^n \times (2\times 3)^{2n}}{2^{4n} \times 3^{2n}} = \frac{2^{2n} \times 2^{2n} \times 3^{2n}}{2^{4n} \times 3^{2n}} = \frac{2^{4n}}{2^{4n}} = 1$

[b] [1] The probability of getting an even number $= \frac{7}{15}$

[2] The probability of getting a number divisible by $5 = \frac{3}{15} = \frac{1}{5}$

[3] The probability of getting a prime number $= \frac{6}{15} = \frac{2}{5}$

8 El-Monofia

1 [1] (b) [2] (d) [3] (c)
[4] (a) [5] (b)

2 [1] zero [2] $9+4\sqrt{5}$ [3] 7
[4] $\{0, 3, -3\}$ [5] 3

3

[a] $\frac{3^{2X+1} \times (5^2)^X}{(3\times 5)^{2X}} = \frac{3^{2X+1} \times 5^{2X}}{3^{2X} \times 5^{2X}} = 3^{2X+1-2X} = 3$

[b] let the number be X $\therefore X + X^2 = 12$

$\therefore X^2 + X - 12 = 0$ $\therefore (X-3)(X+4)=0$

$\therefore X=3$ or $X=-4$ (refused)

$\therefore$ The number is : 3

4

[a] $\because x + \frac{1}{x} = \sqrt{3}$ $\therefore \left(x + \frac{1}{x}\right)^2 = \left(\sqrt{3}\right)^2$

$\therefore x^2 + 2 + \frac{1}{x^2} = 3$ $\therefore x^2 + \frac{1}{x^2} = 1$

[b] $S = \{1, 2, 3, \ldots, 15\}$

[1] The probability of drawing a card carrying a multiple of $6 = \frac{2}{15}$

[2] The probability of drawing a card carrying an even prime number $= \frac{1}{15}$

5

[a] [1] $x(8x^3 + 1) = x(2x + 1)(4x^2 - 2x + 1)$

[2] $x^2 + xy - 12y^2 = (x + 4y)(x - 3y)$

[3] $x^2(x - 3) + 6(x - 3) = (x - 3)(x^2 + 6)$

[4] $(3y - 2)(y + 3)$

[b] [1] $\because x^2 - 10x + 21 = 0$ $\therefore (x - 7)(x - 3) = 0$

$\therefore x = 7$ or $x = 3$ $\therefore$ The S.S. $= \{3, 7\}$

[2] $\because 4 \times 2^{n+5} = 1$ $\therefore 2^2 \times 2^{n+5} = 1$

$\therefore 2^{n+7} = 2^0$ $\therefore n + 7 = 0$

$\therefore n = -7$

9 El-Gharbia

1 [1] $\varnothing$ [2] $\frac{1}{9}$ [3] $\mathbb{R} - \{5\}$

[4] $\frac{m^2}{16}$ cm^2 [5] zero

2 [1] (d) [2] (b) [3] (c)

[4] (c) [5] (c)

3

[a] $\frac{(2^2)^n \times (2 \times 3)^{2n}}{2^{4n} \times 3^{2n}} = \frac{2^{2n} \times 2^{2n} \times 3^{2n}}{2^{4n} \times 3^{2n}} = \frac{2^{4n}}{2^{4n}} = 1$

[b] Let the width be x cm.

$\therefore$ The length $= (x + 5)$ cm.

$\therefore x(x + 5) = 36$

$\therefore x^2 + 5x - 36 = 0$

$\therefore (x - 4)(x + 9) = 0$

$\therefore x = 4$ or $x = -9$ (refused)

$\therefore$ The width $= 4$ cm.

, the length $= 9$ cm.

$\therefore$ Its perimeter $= (4 + 9) \times 2 = 26$ cm.

4

[1] $(x - 3y)(x + 3y)$

[2] $x^2(x - 3) + 6(x - 3) = (x - 3)(x^2 + 6)$

[3] $(5x - 3)(5x - 3)$

[4] $3(x^3 - 27) = 3(x - 3)(x^2 + 3x + 9)$

5

[a] [1] The probability that the number on the chosen card is even $= \frac{5}{10} = \frac{1}{2}$

[2] The probability that the number on the chosen card is divisible by $3 = \frac{3}{10}$

[3] The probability that the number on the chosen card is even prime $= \frac{1}{10}$

[b] $\because 2^{x-2} = 2^5$ $\therefore x - 2 = 5$

$\therefore x = 7$

10 El-Dakahlia

1 [1] 25 [2] $\{3, -3\}$ [3] 42

[4] 6 [5] 1

2

[a] [1] $(x + 5)(x + 3)$

[2] $2(x^3 - 8) = 2(x - 2)(x^2 + 2x + 4)$

[b] $\frac{(2^2)^{x+2} \times (3^2)^x}{(2 \times 3)^{2x}} = \frac{2^{2x+4} \times 3^{2x}}{2^{2x} \times 3^{2x}}$

$= 2^{2x+4-2x} = 2^4 = 16$

3

[a] [1] $(2x - 5)(2x + 5)$

[2] $a(x - 7) + 3(x - 7) = (x - 7)(a + 3)$

[b] [1] $\because 2^{x-2} = 2^4$ $\therefore x - 2 = 4$

$\therefore x = 6$

[2] $\because 3^{x-5} = 7^{x-5}$ $\therefore x - 5 = 0$

$\therefore x = 5$

4 [1] (c) [2] (d) [3] (a)

[4] (a) [5] (c)

5

[a] $\because x^2 - x - 6 = 0$ $\therefore (x - 3)(x + 2) = 0$

$\therefore x = 3$ or $x = -2$ $\therefore$ The S.S. $= \{3, -2\}$

[b] [1] The probability of drawing a white marble $= \frac{17}{50}$

[2] The probability of drawing a red or blue marble $= \frac{13+20}{50} = \frac{33}{50}$

11 Port Said

1 [1] (c) [2] (c) [3] (b)
[4] (d) [5] (a)

2 [1] $(X-1)$ [2] ± 28 [3] 1
[4] 4 , 2 [5] 1

3

[a] [1] $(X-5)(X+5)$
[2] $(X-9)(X-2)$
[3] $(X+2)(X^2-2X+4)$
[4] $y(X+5)+7(X+5)=(X+5)(y+7)$

[b] $\because \left(\frac{2}{5}\right)^{2X-1} = \left(\frac{5}{2}\right)^{3} \quad \therefore \left(\frac{2}{5}\right)^{2X-1} = \left(\frac{2}{5}\right)^{-3}$
$\therefore 2X-1=-3 \quad \therefore 2X=-2$
$\therefore X=-1$

4

[a] $\because X^2+3X-28=0 \quad \therefore (X+7)(X-4)=0$
$\therefore X=-7$ or $X=4 \quad \therefore$ The S.S. $=\{-7, 4\}$

[b] $\frac{(\sqrt{3})^{8} \times (\sqrt{3})^{-14}}{(\sqrt{3})^{-4}} = (\sqrt{3})^{8-14+4} = (\sqrt{3})^{-2} = \frac{1}{3}$

5

[a] $(7.3)^2 + 2 \times 7.3 \times 2.7 + (2.7)^2$
$= (7.3+2.7)^2 = (10)^2 = 100$

[b] [1] The probability of getting excellent $= \frac{6}{50} = \frac{3}{25}$

[2] The probability of getting good $= \frac{11}{50}$

[3] The probability of getting pass $= \frac{16}{50} = \frac{8}{25}$

12 Kafr El-Sheikh

1 [1] (d) [2] (a) [3] (c)
[4] (d) [5] (b)

2 [1] -3 [2] 4 [3] zero
[4] -1 [5] $\varnothing$

3

[a] [1] $(X-8)(X+3)$
[2] $(X-5)(X^2+5X+25)$
[3] $y(X+5)+3(X+5)=(X+5)(y+3)$

[b] $\because X^2-7X+12=0 \quad \therefore (X-3)(X-4)=0$
$\therefore X=3$ or $X=4$
$\therefore$ The S.S. $=\{3, 4\}$

4

[a] $\frac{(2^2)^n \times (2\times 3)^{2n}}{2^{4n} \times 3^{2n}} = \frac{2^{2n} \times 2^{2n} \times 3^{2n}}{2^{4n} \times 3^{2n}} = \frac{2^{4n}}{2^{4n}} = 1$

[b] [1] $\because \frac{(2^3)^X \times (3^2)^X}{(2\times 3^2)^X} = 2^6 \quad \therefore \frac{2^{3X} \times 3^{2X}}{2^X \times 3^{2X}} = 2^6$
$\therefore 2^{3X-X} = 2^6 \quad \therefore 2^{2X} = 2^6$
$\therefore 2X=6 \quad \therefore X=3$
[2] $\because 3^{X-2} = \frac{1}{3^3} \quad \therefore 3^{X-2} = 3^{-3}$
$\therefore X-2=-3 \quad \therefore X=-1$

5

[a] Let the number be : X
$\therefore X+X^2=12 \quad \therefore X^2+X-12=0$
$\therefore (X-3)(X+4)=0$
$\therefore X=3$ or $X=-4$ (refused)
$\therefore$ The number is 3

[b] [1] The probability of getting a card carrying a number divisible by $5 = \frac{4}{20} = \frac{1}{5}$

[2] The probability of getting a card carrying a prime number $= \frac{8}{20} = \frac{2}{5}$

13 El-Menia

1 [1] (b) [2] (b) [3] (c)
[4] (d) [5] (a)

2 [1] $X+5$ [2] 4 [3] 12.5
[4] 3 [5] 20

3

[1] $(X-5)(X+5)$
[2] $a(b+1)+b+1=(b+1)(a+1)$
[3] $(X+3)(X^2-3X+9)$
[4] $X(X^2+X-12)=X(X+4)(X-3)$

4

[a] $\because x^2 = 3x$ $\therefore x^2 - 3x = 0$

$\therefore x(x-3) = 0$ $\therefore x = 0$ or $x = 3$

[b] $\frac{5^{2x} \times 5^{x-1}}{5^{3x}} = 5^{2x+x-1-3x} = 5^{-1} = \frac{1}{5}$

5

[a] $\because \left(\frac{3}{2}\right)^{x-1} = \left(\frac{2}{3}\right)^3$ $\therefore \left(\frac{3}{2}\right)^{x-1} = \left(\frac{3}{2}\right)^{-3}$

$\therefore x - 1 = -3$ $\therefore x = -2$

[b] [1] $\{3, 5\}$

[2] The probability of getting a number that is divisible by $5 = \frac{1}{6}$

14 Assiut

1 [1] (c) [2] (b) [3] (a) [4] (d) [5] (b)

2 [1] 1 [2] 25 [3] $\frac{1}{2}$ [4] 10 [5] 1

3

[a] [1] $(5x - y)(5x + y)$

[2] $(x + 6)(x^2 - 6x + 36)$

[b] $\because 3^x = 3^3$ $\therefore x = 3$ (1)

, $\because 4^{x+y} = 1$ $\therefore x + y = 0$

From (1) : $\therefore 3 + y = 0$ $\therefore y = -3$

4

[a] $\because x^2 - 1 = 8$ $\therefore x^2 = 9$

$\therefore x = 3$ or $x = -3$ $\therefore$ The S.S. $= \{3, -3\}$

[b] $\frac{(2^2)^{x+1} \times (3^2)^{2-x}}{(2 \times 3)^{2x}} = \frac{2^{2x+2} \times 3^{4-2x}}{2^{2x} \times 3^{2x}}$

$= 2^{2x+2-2x} \times 3^{4-2x-2x}$

$= 2^2 \times 3^{4-4x} = 4 \times 3^{4-4x}$

At $x = 1$

$\therefore 4 \times 3^{4-4\times1} = 4 \times 3^{4-4} = 4 \times 1 = 4$

5

[a] $ay + 5y + 5x + ax = y(a + 5) + x(5 + a)$

$= (a + 5)(y + x)$

[b] [1] The probability of selecting a white marble $= \frac{18}{50} = \frac{9}{25}$

[2] The probability of selecting a red marble $= \frac{12}{50} = \frac{6}{25}$

[3] The probability of selecting a yellow marble $= \frac{0}{50} =$ zero

[4] The probability of selecting a non-red marble $= \frac{18 + 20}{50} = \frac{38}{50} = \frac{19}{25}$

15 Qena

1 [1] 81 [2] 15 [3] 1 [4] 6 [5] 8 , 2 y

2 [1] (d) [2] (c) [3] (c) [4] (b) [5] (c)

3

[1] $(3x - 2)(3x + 2)$

[2] a $(x - 7) + 3(x - 7) = (x - 7)(a + 3)$

[3] $(x - 1)(x^2 + x + 1)$

4

[a] $\because x^2 + 8x + 15 = 0$

$\therefore (x + 3)(x + 5) = 0$

$\therefore x = -3$ or $x = -5$

$\therefore$ The S.S. $= \{-3, -5\}$

[b] $\frac{x^2 \times x^5}{x^3} = x^{2+5-3} = x^4$

5

[a] [1] The probability of getting a card carrying a prime number $= \frac{6}{15} = \frac{2}{5}$

[2] The probability of getting a card carrying a number divisible by $3 = \frac{5}{15} = \frac{1}{3}$

[b] $\because 2^{x-2} = 2^5$ $\therefore x - 2 = 5$

$\therefore x = 7$

Schools Examinations of the previous years on Algebra and Statistics

1 Cairo Governorate — Heliopolis Educational Zone

Answer the following questions :

1 Choose the correct answer :

1 If $X^2 + k X + 25$ is a perfect square , then k = ...

(a) 5 (b) 10 (c) ± 10 (d) ± 5

2 If $5^{X+2} = 1$, then X = ...

(a) 1 (b) -2 (c) 2 (d) 5

3 If $X^2 - a = (X - 3)(X + 3)$, then a = ...

(a) 2 (b) -2 (c) 9 (d) -9

4 The half of the number 2^8 is .....

(a) 2^4 (b) 2^7 (c) 4 (d) -4

5 If $\left(\frac{2}{3}\right)^X = \frac{8}{27}$, then X = ...

(a) 2 (b) 1 (c) 8 (d) 3

6 If $X^3 + 8 = (X + 2)(X^2 + k + 4)$, then k = ...

(a) $-2X$ (b) $4X$ (c) $2X$ (d) $-4X$

2 Complete the following :

1 The S.S. of $X^2 + 9 = 0$ in $\mathbb{R}$ is .....

2 The multiplicative inverse of the number $\left(\sqrt{3}\right)^4$ is .....

3 If $(X - 4)$ is a factor of the expression : $X^2 - 5X + 4$, then the other factor is .....

4 The probability of any event A $\in$ .....

5 $\left(\sqrt{5}\right)^3 \div 5\sqrt{5}$ = ...

3 [a] Factorize each of the following :

1 $aX + bX + 5a + 5b$ 2 $X^3 - 1$ 3 $X^4 + 4$

[b] Find in $\mathbb{R}$ the S.S. of the equation : $X^2 + 9X + 18 = 0$

4 [a] If $3^{X-1} = 27$, find the value of : X

[b] Simplify to the simplest form : $\dfrac{\left(\sqrt{5}\right)^7 \times \left(\sqrt{5}\right)^3}{\left(\sqrt{5}\right)^9 \times \left(\sqrt{2}\right)^{-3}}$

5 **[a]** If $x = 3$, $y = \sqrt{3}$, **find the value of :** $\left(\frac{y}{x}\right)^{-2}$

[b] Simplify the following to the simplest form : $\frac{4^x \times 6^{2x}}{2^{4x} \times 3^{2x}}$

2 Cairo Governorate

East Nasr City Zone
Manarat Heliopolis School

Answer the following questions :

1 **Complete each of the following :**

1 The probability of the impossible event is .....

2 $a x + b y + b x + a y =$ .....

3 Fifth the number 5^{20} is .....

4 If $3^x = 5$, then $(27)^x =$ .....

5 The solution set of the equation : $x^2 + 1 = 0$ in $\mathbb{R}$ is .....

2 **Choose the correct answer :**

1 If the probability that a student succeeds in a subject is 0.8 , then the probability of his failure is .....

(a) 0 (b) 1 (c) 0.2 (d) 0.8

2 If $6^x = 7$, then $6^{x+1} =$ .....

(a) 42 (b) $\frac{7}{6}$ (c) 1 (d) 6

3 $4^3 + 4^3 + 4^3 + 4^3 =$ .....

(a) 4^{12} (b) 4^9 (c) 4^4 (d) 4^{81}

4 The solution set of the equation : $x^2 - 5x + 4 = 0$ in $\mathbb{R}$ is .....

(a) $\{1 , 4\}$ (b) $\{2 , -2\}$ (c) $\varnothing$ (d) $\{1\}$

5 A regular die is thrown once , then the probability of appearance number 7 is .....

(a) 0 (b) 1 (c) $\frac{2}{5}$ (d) $\frac{1}{6}$

6 If $x^2 + k x + 25$ is a perfect square , then k = ...

(a) 5 (b) 10 (c) ± 10 (d) ± 5

3 **[a] Factorize each of the following completely :**

1 $3a^2 + 7a + 2$ 2 $5\ell + 10m + a\ell + 2am$

[b] Find the value of x in each of the following :

1 $(x - 3)^7 = 128$ 2 $4^{2x-1} = 1024$ 3 $5^{x-7} = 1$

4 **[a] Simplify each of the following :**

1 $\dfrac{(\sqrt{3})^{-4} \times (\sqrt{2})^{-5} \times (\sqrt{3})^{-3}}{(\sqrt{3})^{-9} \times (\sqrt{2})^{-7}}$ 2 $\left(\dfrac{2\sqrt{3}}{3\sqrt{2}}\right)^4$

[b] A bag contains balls labeled by the numbers from 1 to 15 , if a ball is drawn at random , **find the probability that the drawn ball carries each of the following :**

1 An even number. 2 A number divisible by 3 3 A prime number.

5 **[a]** In producing 600 electric lamps , if the probability of the defected lamps is 0.05 , then find the number of the good lamps and also the number of the defected.

[b] Find in $\mathbb{R}$ the solution set of each of the following :

1 $x^2 - 9 = 0$ 2 $x^2 = 5x$ 3 $3x = -x^2 - 2$

3 Cairo Governorate

Zietoun Educational Administration
Gomhouria Language School

Answer the following questions :

1 **Choose the correct answer :**

1 If $6^x = 7$, then 6^{x+1} = ...

(a) 8 (b) 13 (c) 36 (d) 42

2 If the expression : $a x^2 + 12x + 9$ is a perfect square , then a = ...

(a) 3 (b) 4 (c) 9 (d) 16

3 If $xy = 3$, $(x + y)^2 = 16$, then $x^2 + y^2$ = ...

(a) 4 (b) 10 (c) 13 (d) 8

4 If a regular die is tossed once , then the probability of appearing the number 7 is .....

(a) $\frac{1}{7}$ (b) $\frac{1}{6}$ (c) 1 (d) 0

5 $3^{\text{zero}} + 3^{-1} - \left(\frac{1}{\sqrt{3}}\right)^2$ = ...

(a) 3 (b) 1 (c) $\frac{1}{3}$ (d) 0

6 If $x + y = 3$, $x^2 - xy + y^2 = 5$, then $x^3 + y^3$ = ...

(a) 15 (b) 25 (c) 8 (d) 7

2 **Complete each of the following :**

1 If three times a number is 3^3 , then $\frac{2}{3}$ this number is .....

2 If $x + y = 7$ and $a - 2b = 4$, then the numerical value of the expression : $a(x + y) - 2b(x + y)$ = ...

3 If $\left(\frac{2}{3}\right)^{x} = \frac{27}{8}$, then $x =$ .....

4 A class has 50 students (boys and girls) , if the probability of choosing a girl randomly is 0.6 , then the number of boys is .....

5 If $x^{3}\, y^{-3} = 8$, then $\frac{y}{x} =$ .....

3 **[a] Factorize each of the following completely :**

1 $9 - y^{2}$ 2 $4x^{4} + 81\, y^{4}$

[b] If $2^{x-2} = \left(\frac{1}{2\sqrt{2}}\right)^{2}$ **, find the value of :** x

4 **[a] Find in $\mathbb{R}$ the S.S. of the equation :** $3x^{2} + 15x - 18 = 0$

[b] Simplify to the simplest form : $(3^{x-1} \times 2^{x+1}) \div 6^{x-1}$

5 **[a]** A positive real number , if its square is added to three times of it , then the result equals 28 Find this number.

[b] A box has 15 regular balls , 3 of them are white , 9 of them are black , a ball is drawn randomly.

Find the probability of the drawn ball is :

1 Black. 2 Not white and not black.

4 Giza Governorate

Omranea Direction
Baraem Misr Language School

Answer the following questions :

1 **Choose the correct answer :**

1 The S.S. of the equation : $x^{2} - 1 = 8$ in $\mathbb{R}$ is .....

(a) $\varnothing$ (b) $\{3\}$ (c) $\{-3\}$ (d) $\{-3 , 3\}$

2 If $6^{x} = 7$, then $6^{x+1} =$ .....

(a) 8 (b) 13 (c) 36 (d) 42

3 If a regular die is thrown once , then the probability that the number 5 appears is .....

(a) $\frac{5}{6}$ (b) $\frac{1}{2}$ (c) $\frac{1}{6}$ (d) $\frac{0}{6}$

4 If $7^{x-3} = 5^{x-3}$, then $x =$ .....

(a) 5 (b) 7 (c) 3 (d) 0

5 $2^{12} \times 3^{12} =$ .....

(a) 6^{2} (b) 6^{4} (c) 6^{12} (d) 6^{24}

6 If the expression : $x^2 + 14x + b$ is a perfect square , then b = ...

(a) 2 (b) 7 (c) 14 (d) 49

2 Complete each of the following :

1 If $\left(\frac{3}{5}\right)^x = \frac{27}{125}$, then x = ...

2 The solution set of the equation : $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

3 If the probability that a student failed is 7% , then the probability that this student succeeded is .....

4 If $3^x = 81$, then x = ...

5 The age of a man now is x years , then his age 7 years ago was ..... years.

3 [a] Factorize each of the following :

1 $8x^2 - 50$ 2 $x^4 + 4y^4$

[b] If a real number is added to its square the result will be 12 , find this number.

4 [a] Find in $\mathbb{Q}$ the solution set of :

1 $x^2 - x = 12$ 2 $4x^2 - 25 = 0$

[b] If $\frac{8^x \times 9^x}{18^x} = 64$, **find :** x

5 [a] A box contains similar balls , 8 white balls , 5 red balls and 7 black balls , if we choose a ball , **then find the probability that the ball is :**

1 White. 2 Black or red.

[b] Find the value of x if : $2^{x-2} = 16$

5 Giza Governorate

Dokki District
Modern Narmer Language School

Answer the following questions :

1 Complete each of the following :

1 If $x = 3$ is a solution of the equation : $x^2 + 2x + k = 0$, then k = ...

2 The solution set of the equation : $x^2 + 4 = 0$ in $\mathbb{R}$ is .....

3 The quadratic equation : $(x + ...)(3x - 2) = 0$ is equivalent to ..... + ... $- 10 = 0$

4 If $3^{x-2} = 27$, then x = ...

5 There are 21 boys and 15 girls in a classroom , if a student is chosen at random , then the probability that the student is a boy equals .....

2 **Choose the correct answer :**

1 The solution set in $\mathbb{R}$ of the equation : $(x-1)^2 = 0$ is .....

(a) $\{0\}$ (b) $\{-1\}$ (c) $\{1, -1\}$ (d) $\{1\}$

2 If $3^x + 3^x + 3^x = 1$, then $x =$ .....

(a) -1 (b) 0 (c) 1 (d) 2

3 $3^{-2} =$ .....

(a) 9 (b) $\frac{1}{9}$ (c) $-\frac{1}{9}$ (d) -9

4 $2^{12} \times 3^{12} =$ .....

(a) 6^2 (b) 6^4 (c) 6^{12} (d) 6^{24}

5 A regular die is thrown once , then the probability that 5 appears is .....

(a) $-\frac{5}{6}$ (b) zero (c) $\frac{1}{6}$ (d) $\frac{5}{6}$

6 The expression : $x^2 + a\,x + 2$ can be factorized , then a = ...

(a) 1 (b) 2 (c) 3 (d) 4

3 **[a] Solve in $\mathbb{R}$ the equations :**

1 $x^2 - x - 12 = 0$ 2 $x(x-2) - 2(2-x) = 0$

[b] The length of a rectangle is more than its width by 5 cm. If its area is 36 cm^2 , then find its dimensions and its perimeter.

4 **[a] Simplify :** $\frac{4^{x+1} \times 9^{2-x}}{6^{2x}}$, then find the value of the result when $x = 2$

[b] If the sum of the square of a positive number and three times this number is 28 , then find the value of this number.

5 **[a] Find the value of x if :** $3^{2x-3} = 243$

[b] A bag contains 20 balls numbered from 1 to 20 , if one ball is drawn at random **, then find the probability that :**

1 The number on this ball is a multiple of 4

2 The number on this ball is less than or equal to 7

6 Giza Governorate — 6 October Directorate

Answer the following questions :

1 **Choose the correct answer :**

1 $(x-2)^2 =$ .....

(a) $x^2 - 4$ (b) $(2+x)^2$ (c) $x^2 + 4$ (d) $x^2 - 4x + 4$

2 $4^3 + 4^3 + 4^3 + 4^3 =$ .....

(a) 4^3 (b) 4^4 (c) 4^{12} (d) 4^{81}

3 If $k\,x^2 - 12\,x + 4$ is a perfect square , then k = ...

(a) -6 (b) -4 (c) -2 (d) 9

4 If $\frac{a}{b} = 1$, then $4\,a - 4\,b =$ .....

(a) 8 (b) 4 (c) 1 (d) 0

5 If $x + y = 3$, $x^2 - xy + y^2 = 5$, then $x^3 + y^3 =$ .....

(a) 15 (b) 25 (c) 8 (d) 7

6 If $3^x = 2$, then $27^x =$ .....

(a) 9 (b) 4 (c) 8 (d) 1

2 Complete the following :

1 If $x^3\,y^{-3} = 8$, then $\frac{y}{x} =$ .....

2 A bag contains 9 cards labeled by numbers from 1 to 9 , a card is drawn randomly , then the probability that this card carries an odd number is .....

3 The S.S. of the equation : $x^2 + 1 = 0$ in $\mathbb{R}$ is .....

4 If $\frac{2x}{5} = 6$, then $x - 5 =$ .....

5 $(a - 2)(2a - 3) =$ ..... $- 7a +$ .....

3 Factorize each of the following :

1 $3x^2 - 48$

2 $x^2 - 7x + 10$

3 $x^3 + 2x^2 - 4x - 8$

4 $2x^3 - 16y^3$

4 [a] Find the S.S. in $\mathbb{R}$:

1 $3^{2n-5} = 1$

2 $\left(\frac{2}{3}\right)^{2n} = \frac{81}{16}$

[b] A bag contains cards numbered from 1 to 20 and a card is drawn randomly

Find the probability of :

1 Getting a number divisible by 4

2 Getting a number multiple of 7

5 [a] Find the real number which if we added its square to its three times , it becomes 28

[b] **Simplify :** $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

7 Alexandria Governorate

Eastern Educational Zone
Taymour English School

Answer the following questions :

1 Complete the following :

1 If $a = \sqrt{3}$, $b = \sqrt{2}$, then the value of $\frac{a^4}{b^4}$ = ...

2 $\frac{(10)^2 \times (10)^{-7}}{(0.1)^2 \times 0.001}$ = ...

3 A numbered card is selected at random from a set of similar cards numbered from 1 to 24 , the probability of getting a card carrying a multiple of 4 is .....

4 $(9\,a^2 - 4\,b^2) = (3\,a - .....)\,(..... + 2\,b)$

5 $(x + 3\,y)^2 = x^2 + ... + 9\,y^2$

2 Choose the correct answer :

1 If $(x + 3)$ is a factor of the expression : $x^2 + x - 6$, then the other factor is .....

(a) $(x - 2)$ (b) $(x - 3)$ (c) $(x + 2)$ (d) $(x + 6)$

2 If $3^x = 27$, $4^{x+y} = 1$, then y = ...

(a) 0 (b) 3 (c) – 3 (d) 1

3 The S.S. of the equation : $x^2 - 3 = 0$ in $\mathbb{R}$ is .....

(a) $\{3 , -3\}$ (b) $\{\sqrt{3}\}$ (c) 9 (d) $\{-\sqrt{3} , \sqrt{3}\}$

4 $\left(\sqrt{3}+\sqrt{2}\right)^9 \left(\sqrt{3}-\sqrt{2}\right)^9$ = ...

(a) 1 (b) $\sqrt{5}$ (c) $\sqrt{6}$ (d) 5

5 Which of the following may be equal to the probability of an event ?

(a) – 0.73 (b) 1.23 (c) 79 % (d) $\frac{4}{3}$

6 If $x^3 + 27 = (x + 3)\,(x^2 + k + 9)$, then k = ...

(a) $-6\,x$ (b) $-3\,x$ (c) $3\,x$ (d) $6\,x$

3 [a] Simplify : $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

[b] Find the value of x : $\left(\frac{2}{5}\right)^{2x+1} = \frac{8}{125}$

4 Factorize each of the following :

1 $(x + 2)^3 - 4x - 8$

2 $a^2 + 2ab + b^2 - c^2$

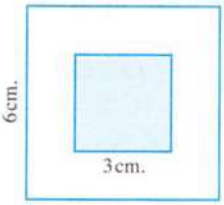
3 $5a^2 - 18a + 16$

4 $xy + 5y + 7x + 35$

5 **[a] Find the S.S. in $\mathbb{R}$: $2x^3 = 18x$**

[b] In the opposite figure :

Two squares , if a person shoots at a picture in the figure , then find the probability of hitting the shaded part.



8 Alexandria Governorate

Mid Educational Zone
Maths Supervision

Answer the following questions :

1 **Complete each of the following :**

1 The simplest form of : $\left(\sqrt{3}\right)^3 \times \left(\sqrt{3}\right)^5 =$ .....

2 If $x + y = 5$, $x - y = 3$, then $x^2 - y^2 =$ .....

3 If $x - 6 = 0$, then $x =$ .....

4 $y^3 -$ ..... $= (y - 2)(y^2 +$ ..... $+ 4)$

5 $\left(\sqrt{7}+\sqrt{6}\right)^8 \left(\sqrt{7}-\sqrt{6}\right)^8 =$ .....

2 **Choose the correct answer :**

1 The expression : $x^2 + 8x + a$ is a perfect square when a = ...

(a) -4 (b) 4 (c) 8 (d) 16

2 A regular die is thrown once , then the probability of appearance 7 on the upper face is .....

(a) $\frac{-5}{6}$ (b) $\frac{1}{6}$ (c) 0 (d) $\frac{5}{6}$

3 If $(x + 3)^{zero} = 1$, then $x \in$ .....

(a) $\mathbb{R} - \{3\}$ (b) $\mathbb{R} - \{-3\}$ (c) $\{3\}$ (d) $\mathbb{R}$

4 If the age of Kamal now is x years , then his age 3 years ago was ..... years.

(a) $x + 3$ (b) $3x$ (c) $x - 3$ (d) $6x$

5 The multiplicative inverse of 1 is .....

(a) 0 (b) 1 (c) 2 (d) 3

6 $3^3 + 3^3 + 3^3 =$ .....

(a) 3^3 (b) 3^4 (c) 3^{12} (d) 3^{81}

3 **[a] Factorize :**

1 $9x^2 - 4$ 2 $10y^2 - 7y - 12$

3 $4x^4 + 1$

[b] Find the solution set in $\mathbb{R}$ for : $2x^2 - 2x - 12 = 0$

4 **[a] Find in the simplest form :** $\frac{x^6 \times x^2}{x^3}$ where $x \neq 0$

[b] Factorize : $3x - 21 + a\,x - 7\,a$

5 **[a]** A numbered card is selected randomly from a set of similar cards numbered from 1 to 15 **Find the probability of getting a card carrying :**

1 A prime number. 2 A number divisible by 3

[b] If $2^{x-2} = 32$ **, then find the value of :** x

9 El-Kalyoubia Governorate — Maths Supervision

Answer the following questions :

1 **Choose the correct answer :**

1 $\mathbb{Z} - \mathbb{Z}^- =$ .....

(a) $\mathbb{Z}^+$ (b) $\mathbb{N}$ (c) $\varnothing$ (d) $\{0\}$

2 The volume of the cube of side length 3 cm. equals ..... cm^3

(a) 9 (b) 12 (c) 27 (d) 81

3 The expression : $x^2 + 4x + a$ is a perfect square when a = ...

(a) 3 (b) 4 (c) 8 (d) 16

4 The S.S. of the equation : $x^2 - x = 0$ is ..... in $\mathbb{R}$

(a) $\{0\}$ (b) $\varnothing$ (c) $\{0\ ,\ 1\}$ (d) $\{1\}$

5 If $(x - 1)$ is one factor of the expression : $x^2 - 4x + 3$, then the other factor is .....

(a) $x + 3$ (b) $x + 1$ (c) $x - 3$ (d) $x - 4$

6 If $\left(\frac{5}{3}\right)^x = \left(\frac{3}{5}\right)^2$, then $x =$ .....

(a) -2 (b) 2 (c) $\frac{1}{2}$ (d) $\frac{-1}{2}$

2 **Complete :**

1 If $7^{x-1} = 3^{x-1}$, then $x =$ .....

2 A bag contains 9 cards labled by numbers from 1 to 9 , a card is drawn randomly , then the probability that the card carries an odd number is .....

3 $a^{-4} + 1 = a^{-4}$ (..... + ...) where $a \neq 0$

4 $1 - \frac{3}{4} =$ .....

5 $4^3 + 4^3 + 4^3 + 4^3 = 4^{.....}$

3 **[a] Factorize :**

1 $x^2 - y^2$ 2 $y^3 + 8$

[b] Find the S.S. of the following equation in $\mathbb{R}$: $x^2 - x - 6 = 0$

4 **[a] Factorize :**

1 $a x - 7a + 3x - 21$ 2 $x^2 - 5x$

[b] If $3^x = 27$, $4^{x+y} = 1$, find the value of each of : x , y

5 **[a] Find in the simplest form : $\frac{4^{x+1} \times 9^{2-x}}{(6)^{2x}}$, then calculate the result when $x = 1$**

[b] If one digit of the number 37450 is chosen at random , find the probability that the chosen digit is an even number.

10 El-Monofia Governorate

Kwesna Educational Directorate
Mathematics Supervision

Answer the following questions : *(Calculator is premitted)*

1 **Choose the correct answer from those given :**

1 $0.002 \times 0.05 =$ .....

(a) 10^{-5} (b) 10^{-4} (c) 10^4 (d) 10^5

2 The expression : $(x - 2y)(x^2 + 2xy + 4y^2)$ equals .....

(a) $x^3 - 2y^3$ (b) $x^3 - 8y^3$ (c) $x^3 + 8y^3$ (d) $x^3 + 18y^3$

3 The value of the expression : $5^{20} + 5^{21}$ equals .....

(a) 5×5^{40} (b) 5×5^{41} (c) 6×5^{20} (d) 6×5^{21}

4 The value of the expression : $2^5 + \left(\sqrt{2}\right)^{10}$ equals .....

(a) 2^6 (b) 2^{10} (c) $\left(\sqrt{2}\right)^{15}$ (d) $\left(\sqrt{2}\right)^{20}$

5 If the probability of choosing a boy from a class of 40 students is 0.375 , then the number of girls is ..... girls.

(a) 35 (b) 25 (c) 20 (d) 15

6 The solution set of the equation : $(x - 1)^2 = 0$ in $\mathbb{R}$ is .....

(a) $\{-1\}$ (b) $\{1\}$ (c) $\{-1 , 1\}$ (d) $\{2\}$

2 **Complete :**

1 The expression : $x^2 - 2x + k$ is perfect square when k = ...

2 If $3^x \times 2^{-x} = 1.5$, then $x =$ .....

3 If $a^2 + b^2 = 7$, $ab = 3$, then $(a - b)^2 =$ .....

4 $x(y - z) + \ell(y - z) = (y - z)$ (.....)

5 $\left(\frac{\sqrt{3}}{9}\right)^{-1} = \left(\sqrt{3}\right)^{.....}$

3 **[a]** An integer is added to its multiplicative inverse , the result equals 2 Find the number.

[b] Factorize each of the following :

1 $3x^2 - 15x + 12$ 2 $\frac{1}{3}x^3 - 9$

3 $x^4 + 9x^2 + 81$

4 **[a] Simplify :** $\frac{4^{x+1} \times 9^{2-x}}{(6)^{2x}}$, then calculate its value at $x = 1$

[b] If $x = \frac{\sqrt{3}}{2}$, $y = \frac{1}{\sqrt{3}}$, $z = \frac{\sqrt{2}}{2}$, **find the value of :** $x^2 + (xz)^2 \times y^2$

5 **[a]** A set of cards numbered from 0 to 10 , if a card is drawn randomly , **find the probability of each of :**

1 Drawing a card carrying an odd number.

2 Drawing a card carrying a number divisible by 5

[b] Factorize each of the following :

1 $ax - 7a + 3x - 21$ 2 $9x^2 - 25$

11 El-Dakahlia Governorate — Maths Supervision

Answer the following questions :

1 **Complete each of the following :**

1 If $3^{x-1} = 27$, then $x =$ .....

2 If $(x - 5)^0 = 1$, then $x \in$ .....

3 If $a + b = 2$, $(x + y) = 14$, then $a(x + y) + b(x + y) =$ .....

4 The probability of the impossible event = ...

5 If the perimeter of a square is x cm. , then its area is .....

2 **Choose the correct answer :**

1 If $6^x = 7$, then $6^{x+1} =$ .....

(a) 8 (b) 13 (c) 36 (d) 42

2 If the product of multiplying four by a number equals 48 , then the third of this number = ...

(a) 4 (b) 8 (c) 12 (d) 16

3 The value of $2^5 + \left(\sqrt{2}\right)^{10}$ = ...

(a) 2^6 (b) 2^{10} (c) $\left(\sqrt{2}\right)^{15}$ (d) $\left(\sqrt{2}\right)^{20}$

4 The S.S. of the equation : $x^3 + 9x = 0$ in $\mathbb{R}$ is .....

(a) $\{0 , 3\}$ (b) $\{0\}$ (c) $\{0 , -3\}$ (d) $\{0 , 3 , -3\}$

5 If $2^x = 5$, then 8^x = ...

(a) $\frac{5}{8}$ (b) 25 (c) 125 (d) $\frac{64}{125}$

6 If $y^3 - a = (y - 2)(y^2 + 2y + 4)$, then a = ...

(a) 2 (b) 4 (c) 8 (d) – 8

3 Factorize :

1 $x^4 + y^4 - 11x^2y^2$

2 $9x^2 - 4a^2 + y^2 + 6xy$

3 $3x^3 - 2x^2 + 12x - 8$

4 $25x^2 - 30x + 9$

4 [a] If the length of a rectangle is 5 cm. more than its width and its area is 36 cm^2. Find its perimeter.

[b] If $\left(\sqrt{\frac{2}{3}}\right)^x = \frac{4}{9}$, **find the value of :** $\left(\frac{2}{3}\right)^{x-1}$

5 [a] **Prove that :** $\frac{(27)^{x-1} \times 8^x}{\left(2\sqrt{3}\right)^{2x} \times \left(3\sqrt{2}\right)^{2x}} = \frac{1}{27}$

[b] A team plays 30 matches in national league , its drawn probability is 0.3 and its win probability is 0.6 **Calculate the number of loss matches.**

12 Ismailia Governorate

Directorate of Education
Elmanar Language School

Answer the following questions :

1 Complete each of the following :

1 $4a(x + y) - 3b(x + y) = (x + y)$ (..... – .....)

2 The S.S. of the equation : $x^2 + 3x = 0$ in $\mathbb{R}$ is .....

3 If $3^x = 27$, then x = ...

4 The probability of the impossible event is .....

5 If the probability of absent pupils in a school is $\frac{2}{19}$, then the probability of present pupils is .....

2 Choose the correct answer :

1 If $(x-5)^{zero} = 1$, then $x \in$ .....

(a) $\mathbb{R} - \{5\}$ (b) $\mathbb{R} - \{-5\}$ (c) $\{5\}$ (d) $\mathbb{R}$

2 The S.S. in $\mathbb{R}$ of the equation : $x^2 + 25 = 0$ is .....

(a) $\{5\}$ (b) $\{5, -5\}$ (c) $\varnothing$ (d) $\{-5\}$

3 If $5^x = 2$, then $5^{x+2} =$ .....

(a) 25 (b) 2 (c) 50 (d) 100

4 A bag contains 20 balls , 8 of them are white and the rest are black , then the probability of the drawn ball is black is .....

(a) 1 (b) 0.6 (c) 0 (d) $\frac{8}{20}$

5 Which of the following can be the probability of an event ?

(a) 1.2 (b) $\frac{4}{3}$ (c) -0.2 (d) 37 %

6 If $x^2 - a = (x-3)(x+3)$, then a = ...

(a) 3 (b) –3 (c) 9 (d) –9

3 [a] Factorize : 1 $x^3 - 3x^2 + 6x - 18$ 2 $3x^3 - 81$

[b] If $\left(\frac{2}{5}\right)^{2x-1} = \frac{8}{125}$, **find the value of :** x

4 [a] A positive real number if you add its square to its three times , the result will be 28 find the number.

[b] **Find in $\mathbb{R}$ the S.S. of :** $x^2 - 8x = -15$

5 [a] If a card is chosen randomly from 10 cards numbered from 1 to 10 , then find the probability that the number on the chosen card is :

1 Even. 2 Divisible by 3

3 Even prime.

[b] **Prove that :** $\frac{(27)^{x-1} \times 8^x}{\left(2\sqrt{2}\right)^{2x} \times \left(3\sqrt{3}\right)^{2x}} = \frac{1}{27}$

13 Damietta Governorate — Inspection of mathematics

Answer the following questions :

1 Choose the correct answer from those given :

1 3^{-2} = ...

(a) -9 (b) $\frac{1}{9}$ (c) $-\frac{1}{9}$ (d) 9

2 $\sqrt{100-64} = 10 -$ .....

(a) 4 (b) 6 (c) 8 (d) -6

3 If a coin is thrown once , then the probability of appearing a tail equals .....

(a) 1 (b) 0.3 (c) 0.5 (d) 0

4 The solution set of the equation : $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

(a) $\{3\}$ (b) $\{-3\}$ (c) $\varnothing$ (d) $\{3 , -3\}$

5 $4^3 + 4^3 + 4^3 + 4^3$ = ...

(a) 4^3 (b) 4^4 (c) 4^{12} (d) 4^{81}

6 The expression : a $x^2 - 40x + 25$ is a perfect square when a = ...

(a) 2 (b) 4 (c) 9 (d) 16

2 Complete each of the following :

1 If the probability that a pupil succeed is 0.8 , then the probability of his failure is .....

2 If $7^x = 1$, then x = ...

3 $2 \times 6 - 8 \div 4$ = ...

4 If $2^x = 5$, then 2^{-x} = ...

5 If $x - y = 3$ and $x + y = 4$, then $x^2 - y^2$ = ...

3 [a] Simplify : $\dfrac{(\sqrt{3})^8 \times (\sqrt{3})^{-14}}{(\sqrt{3})^{-4}}$

[b] Find the solution set of the following equation in $\mathbb{R}$: $x^2 - 8x = -15$

4 [a] Factorize each of the following expressions :

1 $x^2 - 4y^2$ 2 $x^4 + 4y^4$

[b] Find the solution set of the following equation in $\mathbb{R}$: $3^{x-4} = 9$

5 **[a]** If $a = \sqrt{2}$, $b = \sqrt{3}$, **find the numerical value of :** $\frac{b^4 - a^4}{b^2 + a^2}$

[b] A box contains 5 white , 2 red , 3 green balls , a ball is drawn randomly from the box.
Calculate the probabilities of the following events :

1 The ball is white. 2 The ball is yellow. 3 The ball is not red.

14 El-Fayoum Governorate

Directorate of Education
Supervision of Mathematics

Answer the following questions :

1 **Choose the correct answer :**

1 If $\frac{a}{b} = 1$, then $4a - 4b =$ .....

(a) 8 (b) 4 (c) 1 (d) 0

2 If the probability that a pupil succeeds is 0.7 , then the probability of his failure is .....

(a) 0.7 (b) 0.07 (c) 0.3 (d) 0.03

3 If the age of Ahmed now is x years , then the square of his age is .....

(a) x^2 (b) $2x$ (c) $2x^2$ (d) $x + 2$

4 $(-1)^3 + (-1)^5 =$ .....

(a) 0 (b) -2 (c) 2 (d) 201

5 $(5a)^0 =$ ..... , $a \neq 0$

(a) 5 (b) a (c) 5 a (d) 1

6 If $x - 2y = 3$, $x^2 - 4y^2 = 21$, then $x + 2y =$ .....

(a) 14 (b) 9 (c) 7 (d) 6

2 **Complete each of the following :**

1 $\frac{3}{4} =$ ..... %

2 If $a = 7^x$, $b = 7^{-x}$, then $a \times b =$ .....

3 $2^{-3} \times 2^{-2} \div 4^{-3} =$ .....

4 The solution set of the equation : $x^2 - 6x = 0$ in $\mathbb{R}$ is .....

5 If a fair coin is tossed once , then the probability of appearance of a head is .....

3 **[a]** **Factorize each of the following completely :**

1 $36 - 60k + 25k^2$ 2 $x^4 + 64$

[b] **Find in $\mathbb{R}$ the S.S. of the following equation :** $x^2 + x = 6$

4 **[a] Simplify to the simplest form :** $\dfrac{(\sqrt{5})^{10} \times (-\sqrt{5})^{5}}{(\sqrt{5})^{11}}$

[b] A regular die is thrown once **Find the probability of the appearance of a number :**

1 Even. 2 Between 0 and 6 3 Prime.

5 **[a] Find in $\mathbb{R}$ the S.S. of the following equation :** $2^{n-3} = \frac{1}{4}$

[b] Simplify to the simplest form : $\dfrac{4^{x+1} \times 9^{2-x}}{6^{2x}}$, then calculate its value at $x = 1$

15 El-Menia Governorate

El-Menia Educational Directorate
Menia Kawmia Language School

Answer the following questions :

1 **Complete the following :**

1 The solution set of the equation : $x^2 - 1 = 8$, where $x \in \mathbb{Z}^+$ is .....

2 If $3^{x-4} = 1$, then $x =$ .....

3 The S.S. of the equation : $x^2 - 25 = 0$ in $\mathbb{R}$ is .....

4 If $\left(\frac{2}{3}\right)^{x} = \frac{3}{2}$, then $x =$ .....

5 The volume of a cube of side length 3 cm. equals ..... cm^3

2 **Choose the correct answer :**

1 The S.S. of the equation : $x(x-2) = 0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{2\}$ (c) $\{0, 2\}$ (d) $\{0, -2\}$

2 If $x^3 y^{-3} = 8$, then $\frac{x}{y} =$ .....

(a) $\frac{1}{512}$ (b) $\frac{1}{8}$ (c) $\frac{1}{2}$ (d) 2

3 The expression : $x^2 + k x + 36$ is a perfect square when k equals .....

(a) ± 6 (b) ± 8 (c) ± 12 (d) ± 18

4 $4^3 + 4^3 + 4^3 + 4^3 =$ .....

(a) 4^{12} (b) 16^{12} (c) 16^2 (d) 16^3

5 If the probability of success of a student is 0.75 , then the probability of his failure is .....

(a) 0.20 (b) 0.25 (c) 0.30 (d) 0.35

6 If $(x-1)$ is one factor of the expression : $x-4x+3$, then the other factor is .....

(a) $x+3$ (b) $x+1$ (c) $x-3$ (d) $x-y$

3 **[a]** If $\frac{8^x \times 9^x}{18^x} = 64$, **find :** x

[b] Find the S.S. of the following equation in $\mathbb{R}$ **:** $x^2 - 1 = 8$

4 **Factorize each of the following following expresions :**

1 $a x - 7a + 3x - 21$ 2 $x^3 + 8$ 3 $x^2 - x - 6$

4 $4x^2 - 9$ 5 $x^4 + 324$

5 **[a]** If $(3)^{x-2} = 9$, **then find the value of :** x

[b] A colored marble is drawn randomly out of a box containing 12 red marbles , 18 white marbles and 20 blue marbles.

Find the probability of selecting :

1 A white marble. 2 A yellow marble.

3 A red or blue marble. 4 A non red marble.

2022

Answers of the schools examinations on Algebra and Statistics

1 Cairo

1 [1] (c) [2] (b) [3] (c) [4] (b) [5] (d) [6] (a)

2 [1] $\varnothing$ [2] $\frac{1}{9}$ [3] $(X-1)$ [4] $[0, 1]$ [5] 1

3

[a] [1] $X(a+b)+5(a+b)=(a+b)(X+5)$

[2] $(X-1)(X^2+X+1)$

[3] $X^4+4X^2+4-4X^2$

$=(X^2+2)^2-4X^2$

$=(X^2+2+2X)(X^2+2-2X)$

[b] $\because X^2+9X+18=0 \quad \therefore (X+6)(X+3)=0$

$\therefore X=-6$ or $X=-3$

$\therefore$ The S.S. $=\{-6, -3\}$

4

[a] $\because 3^{X-1}=27 \quad \therefore 3^{X-1}=3^3$

$\therefore X-1=3 \quad \therefore X=4$

[b] $\frac{(\sqrt{5})^7\times(\sqrt{5})^3}{(\sqrt{5})^9\times(\sqrt{2})^{-3}}=(\sqrt{5})^{7+3-9}\times(\sqrt{2})^3$

$=\sqrt{5}\times 2\sqrt{2}=2\sqrt{10}$

5

[a] $\left(\frac{y}{x}\right)^{-2}=\left(\frac{\sqrt{3}}{3}\right)^{-2}=\left(\frac{3}{\sqrt{3}}\right)^2$

$=\frac{(3)^2}{(\sqrt{3})^2}=\frac{9}{3}=3$

[b] $\frac{4^x\times 6^{2x}}{2^{4x}\times 3^{2x}}=\frac{(2^2)^x\times(2\times 3)^{2x}}{2^{4x}\times 3^{2x}}$

$=\frac{2^{2x}\times 2^{2x}\times 3^{2x}}{2^{4x}\times 3^{2x}}$

$=2^{2x+2x-4x}=2^0=1$

2 Cairo

1 [1] zero [2] $(a+b)(X+y)$ [3] 5^{19} [4] 125 [5] $\varnothing$

2 [1] (c) [2] (a) [3] (c) [4] (a) [5] (a) [6] (c)

3

[a] [1] $(3a+1)(a+2)$

[2] $5(\ell+2m)+a(\ell+2m)=(\ell+2m)(5+a)$

[b] [1] $\because (X-3)^7=128 \quad \therefore (X-3)^7=2^7$

$\therefore X-3=2 \quad \therefore X=5$

[2] $\because 4^{2X-1}=1024 \quad \therefore 4^{2X-1}=4^5$

$\therefore 2X-1=5 \quad \therefore 2X=6 \quad \therefore X=3$

[3] $\because 5^{X-7}=1 \quad \therefore X-7=0 \quad \therefore X=7$

4

[a] [1] $\frac{(\sqrt{3})^{-4}\times(\sqrt{2})^{-5}\times(\sqrt{3})^{-3}}{(\sqrt{3})^{-9}\times(\sqrt{2})^{-7}}$

$=(\sqrt{3})^{-4-3+9}\times(\sqrt{2})^{-5+7}$

$=(\sqrt{3})^2\times(\sqrt{2})^2=3\times 2=6$

[2] $\left(\frac{2\sqrt{3}}{3\sqrt{2}}\right)^4=\frac{2^4\times 3^2}{3^4\times 2^2}=\frac{2^2}{3^2}=\frac{4}{9}$

[b] [1] The probability of getting a ball carries an even number $=\frac{7}{15}$

[2] The probability of getting a ball carries a number divisible by $3=\frac{5}{15}=\frac{1}{3}$

[3] The probability of getting a ball carries a prime number $=\frac{6}{15}=\frac{2}{5}$

5

[a] $\because$ The number of defected lamps $=0.05\times 600$

$=30$ lamps.

$\therefore$ The number of good lamps $=600-30$

$=570$ lamps.

[b] [1] $\because X^2-9=0 \quad \therefore (X+3)(X-3)=0$

$\therefore X=-3$ or $X=3$ $\therefore$ The S.S. $=\{3, -3\}$

[2] $\because X^2=5X \quad \therefore X^2-5X=0$

$\therefore X(X-5)=0 \quad \therefore X=0$ or $X=5$

$\therefore$ The S.S. $=\{0, 5\}$

3 $\because 3X = -X^2 - 2$ $\therefore X^2 + 3X + 2 = 0$

$\therefore (X+2)(X+1) = 0$ $\therefore X = -2$ or $X = -1$

$\therefore$ The S.S. $= \{-2, -1\}$

3 Cairo

1 1 (d) 2 (b) 3 (b) 4 (d) 5 (b) 6 (a)

2 1 6 2 28 3 -3 4 20 boys 5 $\frac{1}{2}$

3

[a] 1 $(3-y)(3+y)$

2 $4X^4 + 36X^2y^2 + 81y^4 - 36X^2y^2$

$= (2X^2 + 9y^2)^2 - 36X^2y^2$

$= (2X^2 + 9y^2 + 6Xy)(2X^2 + 9y^2 - 6Xy)$

[b] $\because 2^{X-2} = \frac{1}{2^2 \times 2} = \frac{1}{2^3} = (2)^{-3}$ $\therefore 2^{X-2} = (2)^{-3}$

$\therefore X - 2 = -3$ $\therefore X = -1$

4

[a] $\because 3X^2 + 15X - 18 = 0$ $\therefore 3(X^2 + 5X - 6) = 0$

$\therefore X^2 + 5X - 6 = 0$ $\therefore (X+6)(X-1) = 0$

$\therefore X = -6$ or $X = 1$ $\therefore$ The S.S. $= \{-6, 1\}$

[b] $3^{X-1} \times 2^{X+1} \div 6^{X-1} = \frac{3^{X-1} \times 2^{X+1}}{2^{X-1} \times 3^{X-1}}$

$= 2^{(X+1)-(X-1)} = 2^2 = 4$

5

[a] Let the number be X $\therefore X^2 + 3X = 28$

$\therefore X^2 + 3X - 28 = 0$ $\therefore (X-4)(X+7) = 0$

$\therefore X = 4$ or $X = -7$ (refused)

$\therefore$ The number is : 4

[b] 1 The probability of drawn ball is black $= \frac{9}{15} = \frac{3}{5}$

2 The probability of drawn ball is not white and not black $= \frac{3}{15} = \frac{1}{5}$

4 Giza

1 1 (d) 2 (d) 3 (c) 4 (c) 5 (c) 6 (d)

2 1 3 2 $\varnothing$ 3 93% 4 4 5 $X - 7$

3

[a] 1 $8X^2 - 50 = 2(4X^2 - 25)$

$= 2(2X+5)(2X-5)$

2 $X^4 + 4X^2y^2 + 4y^4 - 4X^2y^2$

$= (X^2 + 2y^2)^2 - 4X^2y^2$

$= (X^2 + 2y^2 + 2Xy)(X^2 + 2y^2 - 2Xy)$

[b] Let the number be X $\therefore X + X^2 = 12$

$\therefore X^2 + X - 12 = 0$ $\therefore (X-3)(X+4) = 0$

$\therefore X = 3$ or $X = -4$

$\therefore$ The number is : 3 or -4

4

[a] 1 $\because X^2 - X - 12 = 0$ $\therefore (X+3)(X-4) = 0$

$\therefore X = -3$ or $X = 4$

$\therefore$ The S.S. $= \{-3, 4\}$

2 $\because 4X^2 - 25 = 0$ $\therefore (2X-5)(2X+5) = 0$

$\therefore 2X = 5$ $\therefore X = \frac{5}{2}$ or $2X = -5$

$\therefore X = \frac{-5}{2}$ $\therefore$ The S.S. $= \left\{\frac{5}{2}, \frac{-5}{2}\right\}$

[b] $\because \frac{8^X \times 9^X}{18^X} = 64$

$\therefore \frac{(2)^{3X} \times (3)^{2X}}{(2 \times 3^2)^X} = 2^6$ $\therefore \frac{2^{3X} \times 3^{2X}}{2^X \times 3^{2X}} = 2^6$

$\therefore 2^{3X-X} = 2^6$ $\therefore 2^{2X} = 2^6$

$\therefore 2X = 6$ $\therefore X = 3$

5

[a] 1 The probability that the choosen ball is white $= \frac{8}{20} = \frac{2}{5}$

2 The probability that the choosen ball is black or red $= \frac{5+7}{20} = \frac{12}{20} = \frac{3}{5}$

[b] $\because 2^{X-2} = 16$ $\therefore 2^{X-2} = 2^4$

$\therefore X - 2 = 4$ $\therefore X = 6$

5 Giza

1 1 -15 2 $\varnothing$ 3 $5, 3X^2, 13X$ 4 5 5 $\frac{7}{12}$

2 1 (d) 2 (a) 3 (b)
4 (c) 5 (c) 6 (c)

3

[a] 1 $\because X^2 - X - 12 = 0$

$\therefore (X+3)(X-4) = 0$

$\therefore X = -3$ or $X = 4$

2 $\because X(X-2) - 2(2-X) = 0$

$\therefore X(X-2) + 2(X-2) = 0$

$\therefore (X-2)(X+2) = 0$

$\therefore X = 2$ or $X = -2$

[b] Let the width be X cm. $\therefore$ The length $= (X+5)$ cm.

$\therefore X(X+5) = 36$ $\therefore X^2 + 5X - 36 = 0$

$\therefore (X-4)(X+9) = 0$

$\therefore X = 4$ or $X = -9$ (refused)

$\therefore$ The width $= 4$ cm. and the length $= 9$ cm.

$\therefore$ The perimeter $= (4+9) \times 2 = 26$ cm.

4

[a] $\frac{(2^2)^{X+1} \times (3^2)^{2-X}}{(2 \times 3)^{2X}} = \frac{2^{2X+2} \times 3^{4-2X}}{2^{2X} \times 3^{2X}}$

$= \frac{2^{2X+2-2X}}{3^{2X-4+2X}} = \frac{2^2}{3^{4X-4}}$

$= \frac{4}{3^{4X-4}}$

When $X = 2$ $\therefore \frac{4}{3^{4\times2-4}} = \frac{4}{3^4} = \frac{4}{81}$

[b] Let the number be X $\therefore X^2 + 3X = 28$

$\therefore X^2 + 3X - 28 = 0$ $\therefore (X-4)(X+7) = 0$

$\therefore X = 4$ or $X = -7$ (refused)

$\therefore$ The number is : 4

5

[a] $\because 3^{2X-3} = 243$ $\therefore 3^{2X-3} = 3^5$

$\therefore 2X - 3 = 5$ $\therefore 2X = 8$

$\therefore X = 4$

[b] 1 The probability of getting a ball carries a multiple of $4 = \frac{5}{20} = \frac{1}{4}$

2 The probability of getting a ball carries a number less than or equal $7 = \frac{7}{20}$

6 Giza

1 1 (d) 2 (b) 3 (d)
4 (d) 5 (a) 6 (c)

2 1 $\frac{1}{2}$ 2 $\frac{5}{9}$ 3 $\varnothing$
4 10 5 $2a^2, 6$

3

1 $3(X^2 - 16) = 3(X-4)(X+4)$

2 $(X-2)(X-5)$

3 $X^2(X+2) - 4(X+2) = (X+2)(X^2-4)$

$= (X+2)(X+2)(X-2)$

$= (X+2)^2(X-2)$

4 $2(X^3 - 8y^3) = 2(X-2y)(X^2 + 2Xy + 4y^2)$

4

[a] 1 $\because 3^{2n-5} = 1$ $\therefore 3^{2n-5} = 3^0$

$\therefore 2n - 5 = 0$ $\therefore 2n = 5$

$\therefore n = \frac{5}{2}$

$\therefore$ The S.S. $= \left\{\frac{5}{2}\right\}$

2 $\because \left(\frac{2}{3}\right)^{2n} = \frac{81}{16}$ $\therefore \left(\frac{2}{3}\right)^{2n} = \left(\frac{3}{2}\right)^4$

$\therefore \left(\frac{2}{3}\right)^{2n} = \left(\frac{2}{3}\right)^{-4}$

$\therefore 2n = -4$ $\therefore n = -2$

$\therefore$ The S.S. $= \{-2\}$

[b] 1 The probability of getting a number divisible by $4 = \frac{5}{20} = \frac{1}{4}$

2 The probability of getting a number multiple of $7 = \frac{2}{20} = \frac{1}{10}$

5

[a] Let the number be X

$\therefore X^2 + 3X = 28$ $\therefore X^2 + 3X - 28 = 0$

$\therefore (X-4)(X+7) = 0$

$\therefore X = 4$ or $X = -7$

$\therefore$ The number is : 4 or -7

[b] $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}} = \frac{(2^2)^n \times (2\times3)^{2n}}{2^{4n} \times 3^{2n}}$

$= \frac{2^{2n} \times 2^{2n} \times 3^{2n}}{2^{4n} \times 3^{2n}} = \frac{2^{4n}}{2^{4n}} = 1$

7 Alexandria

1 [1] $\frac{9}{4}$ [2] 1 [3] $\frac{1}{4}$
[4] 2 b , 3 a [5] 6 x y

2 [1] (a) [2] (c) [3] (d)
[4] (a) [5] (c) [6] (b)

3

[a] $\frac{(2^2)^n \times (2 \times 3)^{2n}}{2^{4n} \times 3^{2n}} = \frac{2^{2n} \times 2^{2n} \times 3^{2n}}{2^{4n} \times 3^{2n}}$

$= \frac{2^{4n}}{2^{4n}} = 1$

[b] $\because \left(\frac{2}{5}\right)^{2x+1} = \left(\frac{2}{5}\right)^3$ $\therefore 2x + 1 = 3$

$\therefore 2x = 2$ $\therefore x = 1$

4

[1] $(x+2)^3 - 4x - 8$

$= (x+2)^3 - 4(x+2)$

$= (x+2)[(x+2)^2 - 4]$

$= (x+2)[(x+2-2)(x+2+2)]$

$= (x+2)[x(x+4)] = x(x+2)(x+4)$

[2] $a^2 + 2ab + b^2 - c^2 = (a^2 + 2ab + b^2) - c^2$

$= (a+b)^2 - c^2$

$= (a+b-c)(a+b+c)$

[3] $(5a - 8)(a - 2)$

[4] $y(x+5) + 7(x+5) = (x+5)(y+7)$

5

[a] $\because 2x^3 - 18x = 0$ $\therefore 2x(x^2 - 9) = 0$

$\therefore 2x(x-3)(x+3) = 0$

$\therefore x = 0$ or $x = 3$ or $x = -3$

$\therefore$ The S.S. $= \{0, 3, -3\}$

[b] $\because$ The area of the big square $= 6 \times 6 = 36$ cm^2

, the area of the small square $= 3 \times 3 = 9$ cm^2

$\therefore$ The probability of hitting the shaded part

$= \frac{9}{36} = \frac{1}{4}$

8 Alexandria

1 [1] 81 [2] 15 [3] 6
[4] 8 , 2 y [5] 1

2 [1] (d) [2] (c) [3] (b)
[4] (c) [5] (b) [6] (b)

3

[a] [1] $(3x - 2)(3x + 2)$

[2] $(5y + 4)(2y - 3)$

[3] $4x^4 + 4x^2 + 1 - 4x^2$

$= (2x^2 + 1)^2 - 4x^2$

$= (2x^2 + 1 + 2x)(2x^2 + 1 - 2x)$

[b] $\because 2x^2 - 2x - 12 = 0$ $\therefore 2(x^2 - x - 6) = 0$

$\therefore 2(x-3)(x+2) = 0$ $\therefore x = 3$ or $x = -2$

$\therefore$ The S.S. $= \{3, -2\}$

4

[a] $\frac{x^6 \times x^2}{x^3} = x^{6+2-3} = x^5$

[b] $3(x-7) + a(x-7) = (x-7)(3+a)$

5

[a] [1] The probability of getting a card carries prime number $= \frac{6}{15} = \frac{2}{5}$

[2] The probability of getting a card carries a number divisible by $3 = \frac{5}{15} = \frac{1}{3}$

[b] $\because 2^{x-2} = 32$ $\therefore 2^{x-2} = 2^5$

$\therefore x - 2 = 5$ $\therefore x = 7$

9 El-Kalyoubia

1 [1] (b) [2] (c) [3] (b)
[4] (c) [5] (c) [6] (a)

2 [1] 1 [2] $\frac{5}{9}$ [3] 1 , a^4
[4] $\frac{1}{4}$ [5] 4

3

[a] [1] $(x - y)(x + y)$

[2] $(y + 2)(y^2 - 2y + 4)$

[b] $\because x^2 - x - 6 = 0$ $\therefore (x-3)(x+2) = 0$

$\therefore x = 3$ or $x = -2$ $\therefore$ The S.S. $= \{3, -2\}$

4

[a] [1] $a(x-7) + 3(x-7) = (x-7)(a+3)$

[2] $x(x-5)$

[b] $\because 3^X = 27 \quad \therefore 3^X = 3^3 \quad \therefore X = 3$

$\because 4^{X+y} = 1 \quad \therefore 4^{X+y} = 4^0$

$\therefore X + y = 0 \quad \therefore 3 + y = 0 \quad \therefore y = -3$

5

[a] $\dfrac{(2^2)^{X+1} \times (3^2)^{2-X}}{(2 \times 3)^{2X}} = \dfrac{2^{2X+2} \times 3^{4-2X}}{2^{2X} \times 3^{2X}}$

$= 2^{2X+2-2X} \times 3^{4-2X-2X}$

$= 2^2 \times 3^{4-4X} = 4 \times 3^{4-4X}$

When $X = 1$

$\therefore 4 \times 3^{4-4X} = 4 \times 3^{4-4} = 4 \times 3^0 = 4 \times 1 = 4$

[b] The probability that the chosen digit is an even number $= \frac{2}{5}$

10 El-Monofia

1 [1] (b) [2] (b) [3] (c)

[4] (a) [5] (b) [6] (b)

2 [1] 1 [2] 1 [3] 1

[4] $(X + L)$ [5] 3

3

[a] Let the number be X

$\therefore$ its multiplicative inverse $= \frac{1}{X}$

$\therefore X + \frac{1}{X} = 2$

(multiplying both sides of the equation by X)

$\therefore X^2 + 1 = 2X$

$\therefore X^2 - 2X + 1 = 0 \quad \therefore (X-1)^2 = 0$

$\therefore X = 1 \quad \therefore$ The number is : 1

[b] [1] $3(X^2 - 5X + 4) = 3(X-4)(X-1)$

[2] $\frac{1}{3}(X^3 - 27) = \frac{1}{3}(X-3)(X^2 + 3X + 9)$

[3] $X^4 + 18X^2 + 81 + 9X^2 - 18X^2$

$= (X^2 + 9)^2 - 9X^2$

$= (X^2 + 9 + 3X)(X^2 + 9 - 3X)$

4

[a] $\dfrac{(2^2)^{X+1} \times (3^2)^{2-X}}{(2 \times 3)^{2X}} = \dfrac{2^{2X+2} \times 3^{4-2X}}{2^{2X} \times 3^{2X}}$

$= 2^{2X+2-2X} \times 3^{4-2X-2X}$

$= 2^2 \times 3^{4-4X} = 4 \times 3^{4-4X}$

when $X = 1$

$\therefore 4 \times 3^{4-4X} = 4 \times 3^{4-4} = 4 \times 3^0 = 4 \times 1 = 4$

[b] $X^2 + (Xz)^2 \times y^2 = \left(\frac{\sqrt{3}}{2}\right)^2 + \left(\frac{\sqrt{3}}{2} \times \frac{\sqrt{2}}{2}\right)^2 \times \left(\frac{1}{\sqrt{3}}\right)^2$

$= \frac{3}{4} + \left(\frac{\sqrt{6}}{4}\right)^2 \times \frac{1}{3} = \frac{3}{4} + \frac{6}{16} \times \frac{1}{3}$

$= \frac{3}{4} + \frac{1}{8} = \frac{6+1}{8} = \frac{7}{8}$

5

[a] [1] The probability of drawing a card carries an odd number $= \frac{5}{11}$

[2] The probability of drawing a card carries a number divisible by $5 = \frac{3}{11}$

[b] [1] a $(X-7) + 3(X-7) = (X-7)(a+3)$

[2] $(3X-5)(3X+5)$

11 El-Dakahlia

1 [1] 4 [2] $\mathbb{R} - \{5\}$ [3] 98

[4] 0 [5] $\frac{X^2}{16}$ cm.^{2}

2 [1] (d) [2] (a) [3] (a)

[4] (b) [5] (c) [6] (c)

3

[1] $X^4 + y^4 - 2X^2y^2 - 9X^2y^2$

$= (X^2 - y^2)^2 - 9X^2y^2$

$= (X^2 - y^2 - 3Xy)(X^2 - y^2 + 3Xy)$

[2] $9X^2 + 6Xy + y^2 - 4a^2$

$= (3X + y)^2 - 4a^2 = (3X + y + 2a)(3X + y - 2a)$

[3] $X^2(3X-2) + 4(3X-2) = (3X-2)(X^2+4)$

[4] $(5X-3)^2$

4

[a] Let the width be X cm.

$\therefore$ The length $= (X+5)$ cm.

$\therefore X(X+5) = 36 \quad \therefore X^2 + 5X - 36 = 0$

$\therefore (X-4)(X+9) = 0$

$\therefore X = 4$ or $X = -9$ (refused)

$\therefore$ The width $= 4$ cm. and the length $= 9$ cm.

$\therefore$ The perimeter $= (4+9) \times 2 = 26$ cm.

[b] $\because \left(\sqrt{\frac{2}{3}}\right)^X = \frac{4}{9}$ $\quad \therefore \left(\sqrt{\frac{2}{3}}\right)^X = \frac{(\sqrt{2})^4}{(\sqrt{3})^4}$

$\therefore \left(\sqrt{\frac{2}{3}}\right)^X = \left(\sqrt{\frac{2}{3}}\right)^4$ $\quad \therefore X = 4$

$\therefore$ The value of $\left(\frac{2}{3}\right)^{X-1} = \left(\frac{2}{3}\right)^{4-1} = \left(\frac{2}{3}\right)^3 = \frac{8}{27}$

5

[a] $\because$ L.H.S. $= \frac{(3^3)^{X-1} \times (2^3)^X}{2^{2X} \times (\sqrt{3})^{2X} \times 3^{2X} \times (\sqrt{2})^{2X}}$

$= \frac{3^{3X-3} \times 2^{3X}}{2^{2X} \times 3^X \times 3^{2X} \times 2^X}$

$= 3^{3X-3-2X-X} \times 2^{3X-2X-X}$

$= 3^{-3} \times 2^0 = \frac{1}{3^3} \times 1 = \frac{1}{27} =$ R.H.S.

[b] The probability of loosing matches

$= 1 - 0.3 - 0.6 = 0.1$

$\therefore$ The number of loss matches $= 0.1 \times 30 = 3$ matches.

12 Ismailia

1 [1] 4 a , 3 b [2] $\{0, -3\}$ [3] 3

[4] 0 [5] $\frac{17}{19}$

2 [1] (a) [2] (c) [3] (c)

[4] (b) [5] (d) [6] (c)

3

[a] [1] $X^2(X-3) + 6(X-3) = (X-3)(X^2+6)$

[2] $3(X^3 - 27) = 3[(X-3)(X^2+3X+9)]$

[b] $\because \left(\frac{2}{5}\right)^{2X-1} = \frac{8}{125}$ $\quad \therefore \left(\frac{2}{5}\right)^{2X-1} = \left(\frac{2}{5}\right)^3$

$\therefore 2X - 1 = 3$ $\quad \therefore 2X = 4$ $\quad \therefore X = 2$

4

[a] Let the number be X $\quad \therefore X^2 + 3X = 28$

$\therefore X^2 + 3X - 28 = 0$ $\quad \therefore (X-4)(X+7) = 0$

$\therefore X = 4$ *or* $X = -7$ (refused)

$\therefore$ The number is : 4

[b] $\because X^2 - 8X + 15 = 0$ $\quad \therefore (X-5)(X-3) = 0$

$\therefore X = 5$ or $X = 3$

$\therefore$ The S.S. $= \{3, 5\}$

5

[a] [1] The probability that the number on the chosen card is even $= \frac{5}{10} = \frac{1}{2}$

[2] The probability that the number on the chosen card is divisible by 3 $= \frac{3}{10}$

[3] The probability that the number on the chosen card is even prime $= \frac{1}{10}$

[b] $\because$ L.H.S. $= \frac{(3^3)^{X-1} \times (2^3)^X}{2^{2X} \times (\sqrt{2})^{2X} \times 3^{2X} \times (\sqrt{3})^{2X}}$

$= \frac{3^{3X-3} \times 2^{3X}}{2^{2X} \times 2^X \times 3^{2X} \times 3^X}$

$= 3^{3X-3-2X-X} \times 2^{3X-2X-X}$

$= 3^{-3} \times 2^0 = \frac{1}{3^3} \times 1 = \frac{1}{27} =$ R.H.S.

13 Damietta

1 [1] (b) [2] (a) [3] (c)

[4] (c) [5] (b) [6] (d)

2 [1] 0.2 [2] 0 [3] 10

[4] $\frac{1}{5}$ [5] 12

3

[a] $\frac{(\sqrt{3})^8 \times (\sqrt{3})^{-14}}{(\sqrt{3})^{-4}} = (\sqrt{3})^{8-14+4} = (\sqrt{3})^{-2}$

$= \frac{1}{(\sqrt{3})^2} = \frac{1}{3}$

[b] $\because X^2 - 8X + 15 = 0$ $\quad \therefore (X-5)(X-3) = 0$

$\therefore X = 5$ or $X = 3$ $\quad \therefore$ The S.S. $= \{3, 5\}$

4

[a] [1] $(X-2y)(X+2y)$

[2] $X^4 + 4y^4 + 4X^2y^2 - 4X^2y^2$

$= (X^2 + 2y^2)^2 - 4X^2y^2$

$= (X^2 + 2y^2 + 2Xy)(X^2 + 2y^2 - 2Xy)$

[b] $\because 3^{X-4} = 9$ $\quad \therefore 3^{X-4} = 3^2$

$\therefore X - 4 = 2$ $\quad \therefore X = 6$

$\therefore$ The S.S. $= \{6\}$

5

[a] $\frac{b^4 - a^4}{b^2 + a^2} = \frac{(\sqrt{3})^4 - (\sqrt{2})^4}{(\sqrt{3})^2 + (\sqrt{2})^2} = \frac{9-4}{3+2} = \frac{5}{5} = 1$

[b] 1 The probability of drawn ball is white

$= \frac{5}{10} = \frac{1}{2}$

2 The probability of drawn ball is yellow

$= \frac{0}{10} = 0$

3 The probability of drawn ball is not red

$= \frac{5+3}{10} = \frac{8}{10} = \frac{4}{5}$

14 El-Fayoum

1 1 (d) 2 (c) 3 (a)
4 (b) 5 (d) 6 (c)

2 1 75 2 1 3 2
4 $\{0, 6\}$ 5 $\frac{1}{2}$

3

[a] 1 $25k^2 - 60k + 36 = (5k-6)^2$

2 $X^4 + 64 + 16X^2 - 16X^2$
$= (X^2+8)^2 - 16X^2$
$= (X^2+8+4X)(X^2+8-4X)$

[b] $\because X^2 + X - 6 = 0$ $\therefore (X-2)(X+3) = 0$
$\therefore X = 2$ or $X = -3$ $\therefore$ The S.S. $= \{2, -3\}$

4

[a] $\frac{(\sqrt{5})^{10} \times -(\sqrt{5})^5}{(\sqrt{5})^{11}} = \frac{-(\sqrt{5})^{15}}{(\sqrt{5})^{11}} = -(\sqrt{5})^4 = -25$

[b] 1 The probability of appearing an even number

$= \frac{3}{6} = \frac{1}{2}$

2 The probability of appearing a number between zero and 6 $= \frac{5}{6}$

3 The probability of appearing a prime number

$= \frac{3}{6} = \frac{1}{2}$

5

[a] $\because 2^{n-3} = \frac{1}{(2)^2}$ $\therefore 2^{n-3} = (2)^{-2}$
$\therefore n - 3 = -2$ $\therefore n = 1$
$\therefore$ The S.S. $= \{1\}$

[b] $\frac{(2^2)^{X+1} \times (3^2)^{2-X}}{(2\times 3)^{2X}} = \frac{2^{2X+2} \times 3^{4-2X}}{2^{2X} \times 3^{2X}}$

$= 2^{2X+2-2X} \times 3^{4-2X-2X}$

$= 2^2 \times 3^{4-4X} = 4 \times 3^{4-4X}$

at $X = 1$

$\therefore 4 \times 3^{4-4X} = 4 \times 3^{4-4} = 4 \times 3^0 = 4 \times 1 = 4$

15 El-Menia

1 1 $\{3\}$ 2 4 3 $\{5, -5\}$
4 -1 5 27

2 1 (c) 2 (d) 3 (c)
4 (c) 5 (b) 6 (c)

3

[a] $\because \frac{(2^3)^X \times (3^2)^X}{(2\times 3^2)^X} = 64$ $\therefore \frac{2^{3X} \times 3^{2X}}{2^X \times 3^{2X}} = 2^6$

$\therefore 2^{3X-X} = 2^6$ $\therefore 2^{2X} = 2^6$

$\therefore 2X = 6$ $\therefore X = 3$

[b] $\because X^2 - 1 = 8$ $\therefore X^2 - 9 = 0$

$\therefore (X-3)(X+3) = 0$ $\therefore X = 3$ or $X = -3$

$\therefore$ The S.S. $= \{3, -3\}$

4

1 $a(X-7) + 3(X-7) = (X-7)(a+3)$

2 $(X+2)(X^2 - 2X + 4)$

3 $(X-3)(X+2)$

4 $(2X-3)(2X+3)$

5 $X^4 + 36X^2 + 324 - 36X^2$
$= (X^2+18)^2 - 36X^2$
$= (X^2+18+6X)(X^2+18-6X)$

5

[a] $\because 3^{X-2} = 9$ $\therefore 3^{X-2} = 3^2$

$\therefore X - 2 = 2$ $\therefore X = 4$

[b]

1 The probability of selecting a white marble

$= \frac{18}{50} = \frac{9}{25}$

2 The probability of selecting a yellow marble

$= \frac{0}{50} = 0$

3 The probability of selecting a red or blue marble

$= \frac{12+20}{50} = \frac{32}{50} = \frac{16}{25}$

4 The probability of selecting a non red marble

$= \frac{18+20}{50} = \frac{38}{50} = \frac{19}{25}$

Schools Examinations on Algebra and Statistics

1 Cairo Governorate

East Nasr City Adminstration
Al Raya Language School

Answer the following questions :

Remark: Some school exams are modified to include what was canceled last year

1 Complete :

1 If $x + y = 4$, $x - y = 2$, then $x^2 - y^2 =$ .....

2 A bag contain a number of similar balls , 4 of them are white and the rest is red , if the probability of drawing a white ball is $\frac{2}{3}$, then the number of red balls equals .....

3 If $3^x = 81$, then $x + 1 =$ .....

4 The simplest form of $\left(\sqrt{5}\right)^{-4} =$ .....

5 If $(x + 3)$ one factor of the expression : $x^2 + x - 6$, then the other factor is .....

2 Choose the correct answer from the given ones :

1 $4^5 + 4^5 + 4^5 + 4^5 =$ .....

(a) 4^{12} (b) 4^{20} (c) 4^{81} (d) 4^6

2 A man's age now is x years , then his age 7 years ago was ..... years.

(a) $x - 7$ (b) $7x$ (c) $7 - x$ (d) $x + 7$

3 If the expression : $x^2 - 12x + k$ is a perfect square , then $k =$ .....

(a) 3 (b) 36 (c) 9 (d) 6

4 The S.S. of $x^2 + 4 = 0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\varnothing$ (c) $\{0 , 1\}$ (d) $\{1\}$

5 If $a^3 b^{-3} = 8$, then $\frac{a}{b} =$ .....

(a) $\frac{1}{512}$ (b) $\frac{1}{8}$ (c) $\frac{1}{2}$ (d) 2

6 If $a \in \mathbb{R}^*$, m , n are two non negative integers , then $a^m \times a^{-n} = a^{.....}$

(a) $m - n$ (b) $m + n$ (c) $m\,n$ (d) $n - m$

3 Factorize each of the following :

1 $x^3 + 8$ 2 $x^2 - 5x + 6$ 3 $3x - 21 + ax - 7a$

4 $9x^2 - 4$ 5 * $x^4 + 64$

4 **[a] Find in $\mathbb{R}$ the S.S. of the following equation : $x^3 - 8x^2 + 12x = 0$**

[b] [1] Find the positive real number which is if we add its square to three times it , the result will be 28

[2] If $\left(\frac{2}{5}\right)^{2x+1} = \frac{8}{125}$, then find the value of x

5 **[a]** [1] **Simplify to the simplest form : $\frac{6^{2n} \times 4^n}{2^{4n} \times 3^{2n}}$**

[2] If $x = 3$, $y = \sqrt{2}$, **find in the simplest form the value of : $\left(\frac{x}{y}\right)^{-2}$**

[b] Selecting randomly a card out of cards numbered from 1 to 20 ,
Find the probability of getting a card carries :

[1] A perfect square number. [2] A prime number.

2 Cairo Governorate

Heliopolis Educational Zone

Answer the following questions :

1 **Choose the correct answer :**

[1] If $x^2 + kx + 25$ is a perfect square , then k = ...

(a) 5 (b) 10 (c) ± 10 (d) ± 5

[2] If $5^{x+2} = 1$, then x = ...

(a) 1 (b) -2 (c) 2 (d) 5

[3] If $x^2 - a = (x - 3)(x + 3)$, then a = ...

(a) 2 (b) -2 (c) 9 (d) -9

[4] The half of the number 2^8 is = ...

(a) 2^4 (b) 2^7 (c) 4 (d) -4

[5] If $\left(\frac{2}{3}\right)^x = \frac{8}{27}$, then x = ...

(a) 2 (b) 1 (c) 8 (d) 3

[6] If $x^3 + 8 = (x + 2)(x^2 + k + 4)$, then k = ...

(a) $-2x$ (b) $4x$ (c) $2x$ (d) $-4x$

2 **Complete the following :**

[1] The S.S. of $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

[2] The multiplicative inverse of the number $\left(\sqrt{3}\right)^4$ is .....

[3] If $(x - 4)$ is a factor of the expression : $x^2 - 5x + 4$, then the other factor is .....

[4] The probability of any event A $\in$ .....

[5] $\left(\sqrt{5}\right)^3 \div 5\sqrt{5}$ = ...

3 **[a] Factorize each of the following :**

[1] $a\,x + b\,x + 5\,a + 5\,b$ [2] $x^3 - 1$ [3] * $x^4 + 4$

[b] Find in $\mathbb{R}$ the S.S. of the equation : $x^2 + 9\,x + 18 = 0$

4 **[a] If $3^{x-1} = 27$, find the value of : x**

[b] Simplify to the simplest form : $\dfrac{(\sqrt{5})^7 \times (\sqrt{5})^3}{(\sqrt{5})^9 \times (\sqrt{2})^{-3}}$

5 **[a] If $x = 3$, $y = \sqrt{3}$, find the value of :** $\left(\dfrac{y}{x}\right)^{-2}$

[b] Simplify the following to the simplest form : $\dfrac{4^x \times 6^{2x}}{2^{4x} \times 3^{2x}}$

3 Cairo Governorate

El Wailly Directorate School
Mostakbal G.D.L.4

Answer the following questions :

1 **Choose the correct answer :**

[1] If the expression : $x^2 + k\,x + 36$ is a perfect square , then k = ...

(a) ± 6 (b) ± 8 (c) ± 12 (d) ± 18

[2] If $x - y = 5$ and $x^2 + x\,y + y^2 = 7$, then $x^3 - y^3$ = ...

(a) 2 (b) 7 (c) 12 (d) 35

[3] If $3^x = 2$, then $(27)^x$ = ...

(a) 8 (b) 9 (c) 27 (d) 54

[4] If 2 is a solution for the equation : $x^2 - 5\,x + k = 0$, then k = ...

(a) -3 (b) 3 (c) 6 (d) -6

[5] $3^4 + 3^4 + 3^4$ = ...

(a) 3^3 (b) 3^4 (c) 3^{12} (d) 3^5

[6] $\sqrt{100 - (-6)^2}$ = ...

(a) 4 (b) ± 8 (c) 8 (d) 16

2 **Complete each of the following :**

[1] $9\,x^2 - 3\,x = 3\,x\,(3\,x -$ .....$)$

[2] If $3^{x-2} = 1$, then x = ...

[3] If $x^2 - y^2 = 35$ and $x - y = 5$, then $x + y$ = ...

4 $\left(\frac{x}{y}\right)^{-3} = (\ldots\ldots\ldots\ldots)^3$

5 The S.S. of the equation : $x^2 + 4 = 0$ in $\mathbb{R}$ is .....

3 Factorize completely each of the following :

1 $9x^2 - 16$ 2 $x^3 - 125$

3 $2x^2 + 7x - 4$ 4 $x^3 + x^2 + x + 1$

4 [a] Find in $\mathbb{R}$ the S.S. of the equation : $2x^3 = 18x$

[b] Simplify : $\frac{4^{x+1} \times 9^{2-x}}{6^{2x}}$, then find its value at : $x = 1$

5 [a] If $3^{x-4} = 27$, then find the value of : x

[b] A rectangle whose area is 32 cm^2 and its length is twice its width find its length , width and perimeter.

4 Giza Governorate

National Institutes
Al-Horreya Language School

Answer the following questions :

1 Choose the correct answer :

1 The expression : $x^2 + kx + 36$ is a perfect square when k equals .....

(a) ± 6 (b) ± 8 (c) ± 12 (d) ± 18

2 The solution set of the equation : $x^2 - x = 0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{0 , 1\}$ (c) $\varnothing$ (d) $\{1\}$

3 $\left(\sqrt{3}+\sqrt{2}\right)\left(\sqrt{3}-\sqrt{2}\right)$ is .....

(a) 1 (b) $\sqrt{5}$ (c) $\sqrt{6}$ (d) 5

4 A bag contains 10 similar cards labeled from 1 to 10 , a card is drawn at random , then the probability that this card carries a number divisible by 5 is .....

(a) zero (b) $\frac{1}{5}$ (c) $\frac{2}{5}$ (d) $\frac{1}{2}$

5 If $x + y = 3$ and $x^2 - xy + y^2 = 5$, then $x^3 + y^3 =$ .....

(a) 15 (b) 25 (c) 8 (d) 7

6 The volume of a cube of side length 3 cm. equals ..... cm^3

(a) 12 (b) 9 (c) 27 (d) 81

2 Complete :

1. $1 - \frac{1}{4} =$ ..... %
2. The solution set of the equation : $x^2 - 1 = 8$ where $x \in \mathbb{Z}^+$ is .....
3. If $7^{x-1} = 3^{x-1}$, then $x =$ .....
4. The probability of a certain event is .....
5. If $x + y = 4$, $x - y = 2$, then $x^2 - y^2 =$ .....

3 Factorize :

1. $x^3 - 1$
2. $4x^2 - 9$
3. $ax - 7a + 3x - 21$
4. $2x^2 - 7x + 3$
5. * $x^4 + 4y^4$

4 [a] Simplify to the simplest form : $\frac{(\sqrt{2})^5 \times (3)^{-2}}{3 \times (\sqrt{2})^9}$

[b] Find the S.S. for the following equation where $x \in \mathbb{R}$: $x^2 - 8x + 12 = 0$

5 [a] If $2^x = 16$, $3^{x+y} = 1$, **find the values of :** x , y

[b] A bag contains a number of similar balls some of them are red , 2 greens and 4 blues. If the probability of drawing a ball with green color is $\frac{1}{6}$, find the number of red balls.

5 Giza Governorate

6 October Directorate

Answer the following questions :

1 Choose the correct answer :

1. $(x-2)^2 =$ .....

(a) $x^2 - 4$ (b) $(2+x)^2$ (c) $x^2 + 4$ (d) $x^2 - 4x + 4$

2. $4^3 + 4^3 + 4^3 + 4^3 =$ .....

(a) 4^3 (b) 4^4 (c) 4^{12} (d) 4^{81}

3. If $kx^2 - 12x + 4$ is a perfect square , then $k =$ .....

(a) -6 (b) -4 (c) -2 (d) 9

4. If $\frac{a}{b} = 1$, then $4a - 4b =$ .....

(a) 8 (b) 4 (c) 1 (d) 0

5 If $x + y = 3$, $x^2 - xy + y^2 = 5$, then $x^3 + y^3 =$ .....

(a) 15 (b) 25 (c) 8 (d) 7

6 If $3^x = 2$, then $27^x =$ .....

(a) 9 (b) 4 (c) 8 (d) 1

2 Complete the following :

1 If $x^3 y^{-3} = 8$, then $\frac{y}{x} =$ .....

2 A bag contains 9 cards labeled by numbers from 1 to 9 , a card is drawn randomly , then the probability that this card carries an odd number = ...

3 The S.S. of the equation : $x^2 + 1 = 0$ in $\mathbb{R}$ is .....

4 If $\frac{2x}{5} = 6$, then $x - 5 =$ .....

5 $(a - 2)(2a - 3) =$ ..... $- 7a +$ .....

3 Factorize each of the following :

1 $3x^2 - 48$ 2 $x^2 - 7x + 10$

3 $x^3 + 2x^2 - 4x - 8$ 4 $2x^3 - 16y^3$

4 [a] Find the S.S. in $\mathbb{R}$:

1 $3^{2n-5} = 1$ 2 $\left(\frac{2}{3}\right)^{2n} = \frac{81}{16}$

[b] A bag contains cards numbered from 1 to 20 and card drawn randomly

Find the probability of :

1 Getting a number divisible by 4 2 Getting a number multiple of 7

5 [a] Find the real number which if we added its square to its three times , it becomes 28

[b] Simplify : $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

6 Alexandria Governorate

Mid Educational Zone
Maths Supervision

Answer the following questions :

1 Complete each of the following :

1 The simplest form of : $\left(\sqrt{3}\right)^3 \times \left(\sqrt{3}\right)^5 =$ .....

2 If $x + y = 5$, $x - y = 3$, then $x^2 - y^2 =$ .....

3 If $x - 6 = 0$, then $x =$ .....

4 $y^3 -$ ..... $= (y - 2)(y^2 +$ ..... $+ 4)$

5 $\left(\sqrt{7}+\sqrt{6}\right)^8 \left(\sqrt{7}-\sqrt{6}\right)^8 =$ .....

2 Choose the correct answer :

1 The expression : $x^2 + 8x + a$ is a perfect square when a = ...

(a) -4 (b) 4 (c) 8 (d) 16

2 A die is thrown once , then the probability of appearance 7 on the upper face is .....

(a) $\frac{-5}{6}$ (b) $\frac{1}{6}$ (c) 0 (d) $\frac{5}{6}$

3 If $(x + 3)^{zero} = 1$, then $x \in$ .....

(a) $\mathbb{R} - \{3\}$ (b) $\mathbb{R} - \{-3\}$ (c) $\{3\}$ (d) $\mathbb{R}$

4 If the age of Kamal now is x years , then his age 3 years ago was ..... years.

(a) $x + 3$ (b) $3x$ (c) $x - 3$ (d) $6x$

5 The multiplicative inverse of 1 is .....

(a) 0 (b) 1 (c) 2 (d) 3

6 $3^3 + 3^3 + 3^3 =$ .....

(a) 3^3 (b) 3^4 (c) 3^{12} (d) 3^{81}

3 [a] Factorize :

1 $9x^2 - 4$ 2 $10y^2 - 7y - 12$

3 * $4x^4 + 1$

[b] Find the solution set in $\mathbb{R}$ for : $2x^2 - 2x - 12 = 0$

4 [a] Find in the simplest form : $\frac{x^6 \times x^2}{x^3}$ where $x \neq 0$

[b] Factorize : $3x - 21 + ax - 7a$

5 [a] A numbered card is selected randomly from a set of similar cards numbered from 1 to 15

Find the probability of getting a card carries :

1 A prime number. 2 A number divisible by 3

[b] If $2^{x-2} = 32$, **then find the value of :** x

7 Alexandria Governorate

East Educational Zone
Math's Supervision

Answer the following questions :

1 Complete the following :

1. If $x : 49 = 2 : 7$, then $x =$ .....
2. If $2^x = 8$, then $x =$ .....
3. The value of the expression : $3^5 + \left(\sqrt{3}\right)^{10} - 2\,(3)^5 =$ .....
4. $6x^2 - 11x - 10 = (2x -$ ..... $)($ ..... $+ 2)$
5. $1 , 4 , 9 , 16 ,$ ..... (in the same pattern)

2 Choose the correct answer from those given :

1. If $5x = 35$, then $2x + 1 =$ .....

(a) 7 (b) 8 (c) 15 (d) 71

2. If $5^x = 4$, then $5^{x-1} =$ .....

(a) 1.25 (b) 0.8 (c) 0.125 (d) 0.08

3. If $x^2 - y^2 = 16$, $y - x = 2$, then $x + y =$ .....

(a) 4 (b) 8 (c) -8 (d) 2

4. A regular die is thrown and observed the upper face , then the probability of appearance a number divisible by 3 is .....

(a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{3}{4}$

5. If the expression : $x^2 + 14x + b$ is a perfect square , then $b =$ .....

(a) 2 (b) 7 (c) 14 (d) 49

6. If $3^x + 3^x + 3^x = 1$, then $x =$ .....

(a) -1 (b) 0 (c) $\frac{1}{3}$ (d) 1

3 [a] A bag contain a number of similar balls , some of them are red , 2 greens , 4 blues. If the probability of drawing a ball with green color is $\frac{1}{6}$ Find the number of red balls.

[b] Factorize each of the following expression :

1. $2x^2 + 7x + 3$
2. $x^2 - 5x$

4 [a] Find the S.S. for the following equation where $x \in \mathbb{R}$: $x^2 - 8x + 12 = 0$

[b] Simplify to the simplest form : $\dfrac{\left(\sqrt{2}\right)^5 \times (3)^{-2}}{3 \times \left(\sqrt{2}\right)^9}$

5 **[a]** Find the dimensions of a rectangle whose length is 4 cm. more than its width and whose area is 21 cm^2.

[b] If $\frac{8^x \times 9^x}{18^x} = 64$ find the value of 4^{-x}

8 El-Kalyoubia Governorate

Maths Supervision

Answer the following questions :

1 **Choose the correct answer :**

1 $\mathbb{Z} - \mathbb{Z}^- =$ .....

(a) $\mathbb{Z}^+$ (b) $\mathbb{N}$ (c) $\varnothing$ (d) $\{0\}$

2 The volume of the cube of side length 3 cm. equals ..... cm^3

(a) 9 (b) 12 (c) 27 (d) 81

3 The expression : $x^2 + 4x + a$ is a perfect square when a = ...

(a) 3 (b) 4 (c) 8 (d) 16

4 The S.S. of the equation : $x^2 - x = 0$ is ..... in $\mathbb{R}$

(a) $\{0\}$ (b) $\varnothing$ (c) $\{0, 1\}$ (d) $\{1\}$

5 If $(x - 1)$ is one factor of the expression : $x^2 - 4x + 3$, then the other factor is .....

(a) $x + 3$ (b) $x + 1$ (c) $x - 3$ (d) $x - y$

6 If $\left(\frac{5}{3}\right)^x = \left(\frac{3}{5}\right)^2$, then $x =$ .....

(a) -2 (b) 2 (c) $\frac{1}{2}$ (d) $\frac{-1}{2}$

2 **Complete :**

1 If $7^{x-1} = 3^{x-1}$, then $x =$ .....

2 A bag contains 9 cards labled by numbers from 1 to 9 , a card is drawn randomly , then the probability that the card carries an odd number is .....

3 $a^{-4} + 1 = a^{-4}$ (..... + ...) where $a \neq 0$

4 $1 - \frac{3}{4} =$ .....

5 $4^3 + 4^3 + 4^3 + 4^3 = 4^{.....}$

3 **[a] Factorize :**

1 $x^2 - y^2$ 2 $y^3 + 8$

[b] Find the S.S. of the following equation in $\mathbb{R}$: $x^2 - x - 6 = 0$

4 **[a] Factorize :**

[1] $a\,x - 7\,a + 3\,x - 21$ [2] $x^2 - 5\,x$

[b] If $3^x = 27$, $4^{x+y} = 1$, **find the value of :** x , y

5 **[a] Find in the simplest form :** $\frac{4^{x+1} \times 9^{2-x}}{(6)^{2x}}$, then calculate the result when $x = 1$

[b] If one digit of the number 37450 chosen at random , find the probability that the chosen digit is an even number.

9 El-Monofia Governorate

Kwesna Educational Directorate
Mathematics Supervision

Answer the following questions : (Calculator is premitted)

1 **Choose the correct answer from those given :**

[1] $0.002 \times 0.05 =$ .....

(a) 10^{-5} (b) 10^{-4} (c) 10^4 (d) 10^5

[2] The expression : $(x - 2\,y)(x^2 + 2\,x\,y + 4\,y^2)$ equals .....

(a) $x^3 - 2\,y^3$ (b) $x^3 - 8\,y^3$ (c) $x^3 + 8\,y^3$ (d) $x^3 + 18\,y^3$

[3] The value of the expression : $5^{20} + 5^{21}$ equals .....

(a) 5×5^{40} (b) 5×5^{41} (c) 6×5^{20} (d) 6×5^{21}

[4] The value of the expression : $2^5 + \left(\sqrt{2}\right)^{10}$ equals .....

(a) 2^6 (b) 2^{10} (c) $\left(\sqrt{5}\right)^{15}$ (d) $\left(\sqrt{2}\right)^{20}$

[5] If the probability of choosing a boy from a class of 40 students is 0.375 , then the number of girls is .....

(a) 35 (b) 25 (c) 20 (d) 15

[6] The solution set of the equation : $(x - 1)^2 = 0$ in $\mathbb{R}$ is .....

(a) $\{-1\}$ (b) $\{1\}$ (c) $\{-1\ ,1\}$ (d) $\{2\}$

2 **Complete :**

[1] The expression : $x^2 - 2\,x + k$ is perfect square when k = ...

[2] If $3^x \times 2^{-x} = 1.5$, then $x =$ .....

[3] If $a^2 + b^2 = 7$, $a\,b = 3$, then $(a - b)^2 =$ .....

[4] $x\,(y - z) + L\,(y - z) = (y - z)$ (.....)

[5] $\left(\frac{\sqrt{3}}{9}\right)^{-1} = \left(\sqrt{3}\right)^{.....}$

3 **[a]** An integer is added to its multiplicative inverse the result equals 2 Find the number.

[b] Factorize each of the following :

[1] $3x^2 - 15x + 12$ [2] $\frac{1}{3}x^3 - 9$

[3] * $x^4 + 9x^2 + 81$

4 **[a] Simplify :** $\frac{4^{x+1} \times 9^{2-x}}{(6)^{2x}}$ **, then calculate its value at** $x = 1$

[b] If $x = \frac{\sqrt{3}}{2}$, $y = \frac{1}{\sqrt{3}} = z = \frac{\sqrt{2}}{2}$ **, find the value :** $x^2 + (xz)^2 \times y^2$

5 **[a]** A set of cards numbered from 0 to 10 , if a card is drawn randomly **, find the probability of each :**

[1] Drawing a card carries odd number.

[2] Drawing a card carries a number divisible by 5

[b] Factorize each of the following :

[1] $ax - 7a + 3x - 21$ [2] $9x^2 - 25$

10 El-Gharbia Governorate

Official Languages Schools
The Central Maths Supervision

Answer the following questions :

1 **Choose the correct answer :**

[1] If $x^2 - 2x - k = (x + 3)(x - 5)$, then k = ...

(a) -2 (b) -8 (c) 15 (d) 2

[2] The expression : $x^2 + 14x + b$ is a perfect square , than b = ...

(a) 2 (b) 7 (c) 14 (d) 49

[3] The solution set of the equation : $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

(a) $\{3\}$ (b) $\{-3, 3\}$ (c) $\{-3\}$ (d) $\varnothing$

[4] If $3^{2+x} = 4^{x+2}$, then 7^{x+2} = ...

(a) 7 (b) -7 (c) -2 (d) 1

[5] In a mixed school there are 320 students. If the probability that the ideal student is a boy equals 0.6 , then the number of girls of the school equals ..... girls.

(a) 256 (b) 192 (c) 128 (d) 196

[6] If $\frac{a}{b} = 1$, then $4a - 4b$ = ...

(a) 8 (b) 4 (c) 0 (d) 1

2 Complete each of the following :

1 The solution set of $\frac{x}{4} = \frac{25}{x}$ in $\mathbb{R}$ is .....

2 If $x = \left(\sqrt{5} - 2\right)^7$, $y = \left(\sqrt{5} + 2\right)^7$, then $x\,y =$ .....

3 If $y^3 - a = (y - 2)(y^2 + 2y + 4)$, then $a =$ .....

4 If $(x + 1)$ is one of the factors of the expression : $5x^2 - 2x - 7$, then the other factor is .....

5 $1 - \frac{1}{4} =$ ..... %

3 Factorize each of the following expressions completely :

1 $x^2 + 8x + 15$ 2 $x^3 - 27$

3 $2x^2 + 7x + 3$ 4 $ax - 7a + 3x - 21$

4 [a] If $\frac{8^x \times 9^x}{18^x} = 64$, find the value of : 4^{-x}

[b] Find the solution set of the following equation where $x \in \mathbb{R}$: $x^2 - 8x + 12 = 0$

5 [a] 1 Simplify : $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

2 Find the rational number whose four times its square equals 81

[b] A box contains 3 red balls , 4 yellow balls and 5 green balls.
A ball is drawn randomly from the box. **Find the probability of the drawn ball is :**

1 Yellow 2 Green 3 Not red

11 El-Dakahlia Governorate

Directorate of Education
Maths Supervision

Answer the following questions :

1 Choose the correct answer :

1 If $x + y = 8$ and $x^2 - y^2 = 12$, then $x - y =$ .....

(a) $\frac{2}{3}$ (b) $\frac{3}{2}$ (c) 4 (d) 20

2 The solution set of the equation : $x^2 - 7 = 9$ in $\mathbb{R}$ is .....

(a) $\{4, -4\}$ (b) $\{4\}$ (c) $\varnothing$ (d) $\{16\}$

3 $\frac{3^x \times 3^x \times 3^x}{3^x + 3^x + 3^x} = 1$, then $x =$ .....

(a) 2 (b) 3 (c) $\frac{1}{2}$ (d) $\frac{-1}{3}$

4 If $(x^2 - 10x + a)$ is a perfect square , then a = ...

(a) -5 (b) 5 (c) 25 (d) ± 25

5 A cube of edge length = 6 cm. , then its volume = ... cm^3

(a) 12 (b) 24 (c) 36 (d) 216

6 If $2^x = 5$, then 8^x = ...

(a) 125 (b) 25 (c) 15 (d) 20

2 Complete :

1 If $7^{x+5} = 3^{x+5}$, then x = ...

2 $1 - \frac{2}{5}$ = ... %

3 $x^3 -$ ..... $= (x - 2)(x^2$ ..... $+ 4)$

4 If $x^{-2} + 1 = x^{-2}$ (..... + ...)

5 The probability of a certain event = ...

3 Factorize completely each of the following :

1 $2x^2 - 5x + 3$ 2 $x^3 + x^2 + 3x + 3$

3 $6x^2 - 24$ 4 $8x^3 + 1$

4 [a] Find the solution set in $\mathbb{R}$: $x^2 = 9x - 14$

[b] Find the value of n such that : $\frac{9^{n+1} \times 8^n}{6^{2n+2}} = 16$

5 [a] If $3^x = 81$ and $4^{x+y} = 1$, then find the value of : x , y

[b] A box contains a number of similar balls 8 of them are red balls and the others are white , if the probability of the chosen red ball is $\frac{2}{3}$

Find the number of white balls.

12 Ismailia Governorate

Directorate of Education
Math's Supervision

Answer the following questions :

1 Choose the correct answer :

1 The probability of impossible event = ...

(a) 1 (b) 0 (c) $\frac{1}{2}$ (d) $\varnothing$

2 If $3^{x-2} = 1$, then x = ...

(a) 0 (b) 1 (c) 2 (d) 3

3 $\{2, 3, 6\} \cap \{3, 4, 5\} =$ .....

(a) $\{2\}$ (b) $\{4\}$ (c) $\{6\}$ (d) $\{3\}$

4 If $4x^2 + 12x + m$ is a perfect square , then m = ...

(a) 9 (b) 3 (c) 4 (d) 16

5 $3^x + 3^x + 3^x = 3^{.....}$

(a) $3x$ (b) x^3 (c) $x + 1$ (d) x

6 half of 2^6 = ...

(a) 2^3 (b) 2^5 (c) 2^{12} (d) 2^4

2 Complete :

1 If $4^x = 7$, then 4^{x+1} = ...

2 $12 - 2 \times 4 \div (9 - 5)$ = ...

3 $\left(\frac{3}{4}\right)^x = \frac{27}{64}$, then x = ...

4 The S.S. in $\mathbb{R}$ of : $x^2 + 4 = 0$ is .....

5 $x(a + b) - y(a + b) = (a + b)$ (.....)

3 [a] Factorize each of the following :

1 $x^2 - 11x + 18$ 2 $x^3 + 27$

3 * $4x^4 + y^4$

[b] If $2^x = 32$ and $3^{y+1} = 27$, find the value of : $x - y$

4 [a] If $\frac{8^x \times 9^x}{(18)^x} = 64$, find the value of x , then find the value of 2^x

[b] Find the S.S. in $\mathbb{R}$ of : $x^2 + 4x - 12 = 0$

5 [a] Factorize :

1 $4x^2 - 9$ 2 $5x + ay + 5y + ax$

[b] A box contains 5 red balls , 3 white balls and 3 blue balls. If a ball selected randomly , find the probability of getting :

1 A red ball 2 A red or a blue ball

3 Not a red ball

13 El-Beheira Governorate

Edko Directorate
Maths Supervision

Answer the following questions :

1 Choose the correct answer from the given ones :

1 $(x-2)^2 =$ .....

(a) x^2+4 (b) x^2-4 (c) x^2+4x+4 (d) x^2-4x+4

2 $5^x = 25$, then $x =$ .....

(a) 1 (b) 2 (c) 3 (d) 4

3 The S.S. of : $x^2 + 64 = 0$ in $\mathbb{R}$ is .....

(a) $\{4\}$ (b) $\varnothing$ (c) $\{-4\}$ (d) $\{4, -4\}$

4 If $9^{x+1} = 2^{x+1}$, then x is .....

(a) 1 (b) -1 (c) 0 (d) 2

5 $3^x \times 3^x \times 3^x =$ .....

(a) 3^{3x} (b) 3^{x+1} (c) 3^{x+3} (d) 9^{3x}

6 If the expression : $x^2 + a\,x + 25$ is perfect square , then a = ...

(a) 5 (b) 10 (c) 8 (d) 18

2 Complete each of the following :

1 If $x + y = 2$, $x - y = 8$, then $x^2 - y^2 =$ .....

2 $x^3 - 27 =$ (..... – .....) $(x^2 + 3x + 9)$

3 If $6^{n-2} = 1$, then n = ...

4 Third the number 3^{20} is .....

5 The number $\left(\sqrt{2}\right)^{-2}$ in the simplest form is .....

3 [a] If simplify : $\dfrac{(4)^{x+1} \times (9)^{2-x}}{(6)^{2x}}$, then find the value answer when $x = 1$

[b] Find the S.S. in $\mathbb{Q}$: $x^2 - x = 12$

4 [a] Factorize :

1 $3x^2 + 7x + 2$ 2 $ax - 7a + 3x - 21$

[b] If $3^x = 27$, $4^{x+y} = 1$, **find the value of :** x and y

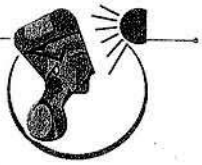
5 [a] The length of rectangle more than its width by 4 cm. and its area 12 cm^2 , find the dimensions of the rectangle.

[b] A card is chosen randomly from ten cards numbered from 5 to 14 ,
What is the probability that the chosen card is :

[1] An even number ? [2] A prime number ?

14 El-Menia Governorate

El-Menia Educational Directorate
Minia Kawmia Language School



Answer the following questions :

1 Complete the following :

[1] The solution set of the equation : $x^2 - 1 = 8$, where $x \in \mathbb{Z}^+$ is .....

[2] If $3^{x-4} = 1$, then $x =$ .....

[3] The S.S. of the equation : $x^2 - 25 = 0$ in $\mathbb{R}$ is .....

[4] If $\left(\frac{2}{3}\right)^x = \frac{3}{2}$, then $x =$ .....

[5] The volume of a cube of side length 3 cm. equals ..... cm^3

2 Choose the correct answer :

[1] The S.S. of the equation : $x(x-2) = 0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{2\}$ (c) $\{0 , 2\}$ (d) $\{0 , -2\}$

[2] If $x^3 y^{-3} = 8$, then $\frac{x}{y} =$ .....

(a) $\frac{1}{512}$ (b) $\frac{1}{8}$ (c) $\frac{1}{2}$ (d) 2

[3] The expression : $x^2 + k x + 36$ is a perfect square when k equals .....

(a) ± 6 (b) ± 8 (c) ± 12 (d) ± 18

[4] $4^3 + 4^3 + 4^3 + 4^3 =$ .....

(a) 4^{12} (b) 16^{12} (c) 16^2 (d) 16^3

[5] If the probability of success of a student is 0.75 , then the probability of his failure is .....

(a) 0.20 (b) 0.25 (c) 0.30 (d) 0.35

[6] If $(x-1)$ is one factor of expression : $x - 4x + 3$, then the other factor is .....

(a) $x + 3$ (b) $x + 1$ (c) $x - 3$ (d) $x - y$

3 [a] If $\frac{8^x \times 9^x}{18^x} = 64$ find : x

[b] Find the S.S. of the equation in $\mathbb{R}$: $x^2 - 1 = 8$

4 **Factorize each of the following expresions :**

[1] $a\,x - 7\,a + 3\,x - 21$ [2] $x^3 + 8$ [3] $x^2 - x - 6$

[4] $4\,x^2 - 9$ [5] * $x^4 + 324$

5 **[a]** If $(3)^{x-2} = 9$, then find the value of : x

[b] A colored marble is drawn randomly out of a box containing 12 red marbles , 18 white marbles and 20 blue marbles.

Find the probability of selecting :

[1] A white marble. [2] A yellow marble.

[3] A red or blue marble. [4] A non red marble.

15 Aswan Governorate

Aswan Educational Directorate
Amr Farid distinct official Language School

Answer the following questions :

1 **Complete each of the following :**

[1] $\left(\frac{-1}{\sqrt{2}}\right)^6 =$ .....

[2] If $x + y = 5$ and $x - y = 4$, then $x^2 - y^2 =$ .....

[3] A regular die is thrown once and observed the upper face , then the probability of appearance number divisible by 5 is .....

[4] $x^3 -$ ..... $= (x - 2)$ (..... $+ 2\,x + 4$)

[5] $\sqrt[3]{0.08 \times 0.1} =$ .....

2 **Choose the correct answer from those given :**

[1] The S.S. of the equation : $x^2 - x = 0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\varnothing$ (c) $\{0 , 1\}$ (d) $\{1\}$

[2] The probability of the certain events is .....

(a) $\frac{1}{2}$ (b) 0 (c) $\varnothing$ (d) 1

[3] If $5^x = 4$, then 5^{x-1} equals .....

(a) 1.25 (b) 0.8 (c) 0.125 (d) 0.08

[4] If $3^x = 5$ and $3^y = 4$, then $3^{x+y} =$ .....

(a) 15 (b) 20 (c) 9 (d) 1

5 The value of : $2^5 + \left(\sqrt{2}\right)^{10}$ is .....

(a) 2^6 (b) 2^{10} (c) $\left(\sqrt{2}\right)^{15}$ (d) $\left(\sqrt{2}\right)^{20}$

6 $(-1)^9 + (-1)^8 =$ .....

(a) 2 (b) 0 (c) 1 (d) -1

3 **[a] If $\left(\frac{2}{5}\right)^{2x-1} = \frac{8}{125}$, find : x**

[b] Find the solution set of the following equation where $x \in \mathbb{R}$: $x^2 - 6x = 0$

4 **[a] Find in the simplest form the value of : $\frac{\left(\sqrt{3}\right)^{-5} \times \left(\sqrt{3}\right)^{-4}}{\left(\sqrt{3}\right)^{-10}}$**

[b] A box contains a number of similar balls , 2 of them are green , 4 are blue and the rest are red , at choosing one randomly , and the probability of the drawn ball with green color is $\frac{1}{6}$, then find the number of red balls.

5 **Factorize each of the following expressions :**

1 $x^2 + 8x + 15$

2 $25x^2 - y^2$

3 $x^3 - 8$

4 $18y^2 - 12y + 2$

5 * $81x^4 + 4z^4$

Some Schools Examinations on Algebra and Statistics

1 Cairo Governorate

East Nasr City Zone
Manaret Heliopolis School

Answer the following questions :

1 Complete each of the following :

(1) The probability of the impossible event is .....

(2) $a x + b y + b x + a y =$ .....

(3) Fifth the number 5^{20} is .....

(4) If $3^{x} = 5$, then $(27)^{x} =$ .....

(5) The solution set of the equation : $x^{2} + 1 = 0$ in $\mathbb{R}$ is .....

---

2 Choose the correct answer :

(1) If the probability that a student succeeds in a subject is 0.8 , then the probability of his failure is .....

(a) 0 (b) 1 (c) 0.2 (d) 0.8

(2) If $6^{x} = 7$, then $6^{x+1} =$ .....

(a) 42 (b) $\frac{7}{6}$ (c) 1 (d) 6

(3) $4^{3} + 4^{3} + 4^{3} + 4^{3} =$ .....

(a) 4^{12} (b) 4^{9} (c) 4^{4} (d) 4^{81}

(4) The solution set of equation : $x^{2} - 5x + 4 = 0$ in $\mathbb{R}$ is .....

(a) $\{1 , 4\}$ (b) $\{2 , -2\}$ (c) $\varnothing$ (d) $\{1\}$

(5) A die is thrown then the probability of appearance number 7 is .....

(a) 0 (b) 1 (c) $\frac{2}{5}$ (d) $\frac{1}{6}$

(6) * If $x^{2} + k x + 25$ is a perfect square , then k = ...

(a) 5 (b) 10 (c) ± 10 (d) ± 5

---

3 [a] Factorize each of the following completely :

(1) * $3a^{2} + 7a + 2$ (2) $5\ell + 10m + a\ell + 2am$

[b] Find the value of the x in each of the following :

(1) $(x - 3)^{7} = 128$ (2) $4^{2x-1} = 1024$ (3) $5^{x-7} = 1$

---

4 [a] Simplify each of the following :

(1) $\dfrac{(\sqrt{3})^{-4} \times (\sqrt{2})^{-5} \times (\sqrt{3})^{-3}}{(\sqrt{3})^{-9} \times (\sqrt{2})^{-7}}$ (2) $\left(\dfrac{2\sqrt{3}}{3\sqrt{2}}\right)^{4}$

[b] A bag contains balls labeled by the numbers from 1 to 15 if a ball is drawn at random
Find the probability that the drawn ball carries each of the following :

① An even number. ② A number divisible by 3. ③ A prime number.

---

5 **[a]** In producing 600 electric lamps , if the probability of the defected lamps is 0.05 , then find the number of the good lamps and also the number if the defected.

[b] Find in $\mathbb{R}$ the solution set of each of the following :

① $x^2 - 9 = 0$ ② $x^2 = 5x$ ③ $3x = -x^2 - 2$

2 Cairo Governorate

Zietoun Educational Administration
Gomhouria language school

Answer the following questions :

1 **Choose the correct answer :**

① If $6^x = 7$, then 6^{x+1} = ...

(a) 8 (b) 13 (c) 36 (d) 42

② If the expression : $a x^2 + 12x + 9$ is a perfect square , then a = ...

(a) 3 (b) 4 (c) 9 (d) 16

③ If $xy = 3$, $(x + y)^2 = 16$, then $x^2 + y^2$ = ...

(a) 4 (b) 10 (c) 13 (d) 8

④ If a regular die is tossed once then the probability of appearing the number 7 = ...

(a) $\frac{1}{7}$ (b) $\frac{1}{6}$ (c) 1 (d) 0

⑤ $3^{\text{zero}} + 3^{-1} - \left(\frac{1}{\sqrt{3}}\right)^2$ = ...

(a) 3 (b) 1 (c) $\frac{1}{3}$ (d) 0

⑥ * If $x + y = 3$, $x^2 - xy + y^2 = 5$, then $x^3 + y^3$ = ...

(a) 15 (b) 25 (c) 8 (d) 7

---

2 **Complete each of the following :**

① If three times a number = 3^3 , then $\frac{2}{3}$ this number = ...

② If $x + y = 7$ and $a - 2b = 4$, then the numerical value of the expression :
$a(x + y) - 2b(x + y)$ = ...

③ If $\left(\frac{2}{3}\right)^x = \frac{27}{8}$, then x = ...

④ A class has 50 students (boys and girls) , if the probability of choosing a girl randomly is 0.6 , then the number of boys = ...

⑤ If $x^3 y^{-3} = 8$, then $\frac{y}{x}$ = ...

3 **[a] Factorize each of the following completely :**

① $* 9 - y^2$ ② $4x^4 + 81y^4$

[b] If $2^{x-2} = \left(\frac{1}{2\sqrt{2}}\right)^2$ **Find the value of :** x

4 **[a] Find in $\mathbb{R}$ the S.S. of the equation :** $3x^2 + 15x - 18 = 0$

[b] Simplify to the simplest form : $(3^{x-1} \times 2^{x+1}) \div 6^{x-1}$

5 **[a]** A positive real number , if its square is added to three times of it then the result equals 28 **Find this number.**

[b] A box has 15 regular balls , 3 of them are white , 9 of them are black , a ball is choosing randomly.

Find the probability of the drawn ball is :

① Black. ② Not white and not black.

3 Cairo Governorate

New Cairo Zone
Manor House Language School

Answer the following questions :

1 **Complete each of the following :**

① If $5^{x-2} = 1$, then x = ...

② The S.S. of the equation : $x^2 - 16 = 0$ in $\mathbb{R}$ is .....

③ The number $\left(\sqrt{2}\right)^{-4}$ in simplest form is .....

④ Bag contains 5 white balls , 2 black balls and 3 blue balls , if a ball was taken randomly , then the probability of this ball is black or white is .....

⑤ If $x = \left(\sqrt{5} - 2\right)^7$ and $y = \left(\sqrt{5} + 2\right)^7$, then xy = ...

2 **Choose the correct answer :**

① If $(x-2)^0 = 1$, then $x \neq$ .....

(a) 3 (b) 2 (c) 1 (d) –3

② If $5^x = 4$, then 5^{x-1} = ...

(a) 1.25 (b) 0.8 (c) 0.125 (d) 0.08

(3) If $X = \frac{\sqrt{8}}{\sqrt{2}}$, then X^{-1} = ...

(a) 2 (b) – 2 (c) $\frac{1}{2}$ (d) $\frac{-1}{2}$

(4) The probability of occurrence of an event is 80% , then the probability of non-occurrence of this event is .....

(a) 0.2 (b) 0.3 (c) 0.4 (d) 0.8

(5) $\left(\frac{\sqrt{5}}{3}\right)^{-2}$ = ...

(a) $\frac{9}{5}$ (b) $-\frac{9}{5}$ (c) $-\frac{5}{9}$ (d) $\frac{5}{9}$

(6) * If the expression : $X^2 + 7X + a$ can be factorized , then a may be equal to .....

(a) 8 (b) 10 (c) 18 (d) 49

---

3 Find the S.S. of the following equations in $\mathbb{R}$:

[a] (1) $X^2 - 7X + 10 = 0$ (2) $X^3 - 9X = 0$

[b] If $a = \sqrt{3}$, $b = \frac{1}{\sqrt{3}}$, **find the value of :** $a^4 + b^{-4}$

---

4 **[a]** A numbered card is selected randomly from a set of similar cards numbered from 1 to 30 , **Find the probability of getting a card that carries :**

(1) A number divisible by 4 (2) A number divisible by 6

(3) A number divisible by 4 and 6

[b] Factorize the following :

(1) $X^4 + 64y^4$ (2) $a^3 - ab^2 - a^2b + b^3$ (3) * $8X^3 - 125$

---

5 **[a]** If the length of a rectangle is more than its width by 5 cm. and if its area 36 cm. find its perimeter.

[b] If $\frac{9^X \times 8^X}{18^X} = 64$, **find the value of :** X

4 Giza Governorate

Dokki District
Modern Narmer language school

Answer the following questions :

1 Complete each of the following :

(1) If $X = 3$ is a solution of the equation : $X^2 + 2X + k = 0$, then k = ...

(2) The solution set of the equation : $X^2 + 4 = 0$ in $\mathbb{R}$ is .....

(3) The quadratic equation : $(X + \cdots\cdots)(3X - 2) = 0$ is equivalent to $\cdots\cdots + \cdots\cdots - 10 = 0$

(4) If $3^{X-2} = 27$, then $X = \cdots\cdots$

(5) There are 21 boys and 15 girls in a classroom , if a student is chosen at random , then the probability that the student is a boy $= \cdots\cdots$

---

2 Choose the correct answer :

(1) The solution set in $\mathbb{R}$ of the equation : $(X - 1)^2 = 0$ is

(a) $\{0\}$ (b) $\{-1\}$ (c) $\{1 , -1\}$ (d) $\{1\}$

(2) If $3^X + 3^X + 3^X = 1$, then $X = \cdots\cdots$

(a) -1 (b) 0 (c) 1 (d) 2

(3) 3^{-2} equals $\cdots\cdots$

(a) 9 (b) $\frac{1}{9}$ (c) $-\frac{1}{9}$ (d) -9

(4) $2^{12} \times 3^{12} = \cdots\cdots$

(a) 6^2 (b) 6^4 (c) 6^{12} (d) 6^{24}

(5) A die is thrown once , then the probability that 5 appears is $\cdots\cdots$

(a) $-\frac{5}{6}$ (b) zero (c) $\frac{1}{6}$ (d) $\frac{5}{6}$

(6) * The expression : $X^2 + aX + 2$ can be factorized , then $a = \cdots\cdots$

(a) 1 (b) 2 (c) 3 (d) 4

---

3 [a] Solve in $\mathbb{R}$ the equations :

(1) $X^2 - X - 12 = 0$ (2) $X(X - 2) - 2(2 - X) = 0$

[b] The length of a rectangle is more than its width by 5 cm. If its area is 36 cm^2 , then find its dimensions and its perimeter.

---

4 [a] Simplify : $\frac{4^{X+1} \times 9^{2-X}}{6^{2X}}$, then find the value of the answer when $X = 2$

[b] If the sum of the square of a positive number and three times this number is 28 , then find the value of this number.

---

5 [a] Find the value of X if : $3^{2X-3} = 243$

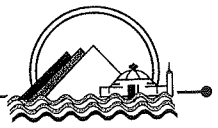
[b] A bag contains 20 balls numbered from 1 to 20 , if one ball is drawn at random , then find the probability that :

(1) The number is a multiple of 4

(2) The number is less than or equal 7

5 Giza Governorate

Omranea Direction
Baraem Misr Language School



Answer the following questions :

1 Choose the correct answer :

① The S.S. of the equation : $x^2 - 1 = 8$ in $\mathbb{R}$ is .....

(a) $\varnothing$ (b) $\{3\}$ (c) $\{-3\}$ (d) $\{-3, 3\}$

② If $6^x = 7$, then 6^{x+1} = ...

(a) 8 (b) 13 (c) 36 (d) 42

③ If a die is thrown once , then the probability that the number 5 appears is .....

(a) $\frac{5}{6}$ (b) $\frac{1}{2}$ (c) $\frac{1}{6}$ (d) $\frac{0}{6}$

④ If $7^{x-3} = 5^{x-3}$, then x = ...

(a) 5 (b) 7 (c) 3 (d) 0

⑤ $2^{12} \times 3^{12}$ = ...

(a) 6^2 (b) 6^4 (c) 6^{12} (d) 6^{24}

⑥ * If the expression : $x^2 + 14x + b$ is a perfect square , then b = ...

(a) 2 (b) 7 (c) 14 (d) 49

2 Complete each of the following :

① $\left(\frac{3}{5}\right)^x = \frac{27}{125}$, then x = ...

② The solution set of the equation : $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

③ If the probability that a student failed is 7% , then the probability that this student succeeded is .....

④ If $3^x = 81$, then x = ...

⑤ The age of a man now x years , then his age 7 years ago is ..... years.

3 [a] Factorize each of the following :

① * $8x^2 - 50$ ② $x^4 + 4y^4$

[b] If a real number is added to its square the result will be 12 , find this number.

4 [a] Find in $\mathbb{Q}$ the solution set of :

① $x^2 - x = 12$ ② $4x^2 - 25 = 0$

[b] If $\frac{8^x \times 9^x}{18^x} = 64$, **find :** x

5 **[a]** A box contains a similar balls , 8 white balls , 5 red balls and 7 black balls , if we choose a ball , **then find the probability that the ball is :**

① White. ② Black or red.

[b] Find the value of x if : $2^{x-2} = 16$

6 Alexandria Governorate

Eastern Educational Zone
Taymour English School

Answer the following questions :

1 **Complete the following :**

① If $a = \sqrt{3}$, $b = \sqrt{2}$, then the value of $\frac{a^4}{b^4}$ = ...

② $\frac{(10)^2 \times (10)^{-7}}{(0.1)^2 \times 0.001}$ = ...

③ A numbered card is selected at random from a set of similar cards numbered from 1 to 24 , the probability of getting a card carries a multiple of 4 is .....

④ $(9\,a^2 - 4\,b^2) = (3\,a - .....)\,(..... + 2\,b)$

⑤ $(x + 3\,y)^2 = x^2 + ... + 9\,y^2$

---

2 **Choose the correct answer :**

① If $(x + 3)$ is a factor of the expression : $x^2 + x - 6$, then the other factor is .....

(a) $(x - 2)$ (b) $(x - 3)$ (c) $(x + 2)$ (d) $(x + 6)$

② If $3^x = 27$, $4^{x+y} = 1$, then y = ...

(a) 0 (b) 3 (c) – 3 (d) 1

③ The S.S. of the equation : $x^2 - 3 = 0$ in $\mathbb{R}$ is .....

(a) $\{3 , -3\}$ (b) $\{\sqrt{3}\}$ (c) 9 (d) $\{-\sqrt{3} , \sqrt{3}\}$

④ $\left(\sqrt{3} + \sqrt{2}\right)^9 \left(\sqrt{3} - \sqrt{2}\right)^9$ = ...

(a) 1 (b) $\sqrt{5}$ (c) $\sqrt{6}$ (d) 5

⑤ Which of the following may be equal the probability of an event .....

(a) – 0.73 (b) 1.23 (c) 79 % (d) $\frac{4}{3}$

⑥ * If $x^3 + 27 = (x + 3)\,(x^2 + k + 9)$, then k = ...

(a) $-6x$ (b) $-3x$ (c) $3x$ (d) $6x$

---

3 **[a] Simplify :** $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

[b] Find the value of x : $\left(\frac{2}{5}\right)^{2x+1} = \frac{8}{125}$

4 **Factorize each of the following :**

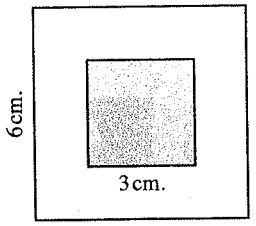
(1) $(x+2)^3 - 4x - 8$ (2) $a^2 + 2ab + b^2 - c^2$

(3) * $5a^2 - 18a + 16$ (4) $xy + 5y + 7x + 35$

---

5 **[a] Find the S.S. in $\mathbb{R}$: $2x^3 = 18x$**

[b] A person shoot at a picture in the opposite figure then find the probability of hitting the shaded part.



7 Alexandria Governorate

Mid Zone
Supervision of Math

Answer the following questions :

1 **Complete each of the following :**

(1) The simplest form of the expression $2^3 \times 2^2 \div 4^3 =$ .....

(2) The solution set of the equation : $x^2 + 4 = 0$ in $\mathbb{R}$ is .....

(3) If $x - 5 = 0$, then $x =$ .....

(4) If $2^x = 3$, then $8^x =$ .....

(5) Subtracting $2x$ from $5x$ gives .....

---

2 **Choose the correct answer :**

(1) We can use factorizing by completing the square to factorize .....

(a) $x^2 - y^2$ (b) $x^3 - y^3$ (c) $x^3 + y^3$ (d) $x^4 + y^4$

(2) A die is thrown once , then the probability of appearance 5 on the upper face is .....

(a) $\frac{-5}{6}$ (b) $\frac{1}{6}$ (c) 0 (d) $\frac{5}{6}$

(3) If $\left(\frac{5}{3}\right)^x = \frac{27}{125}$, then $x =$ .....

(a) –5 (b) –3 (c) 3 (d) 5

(4) If the age of kamal now is x year , then his age after 5 years is .....

(a) $x + 5$ (b) $5x$ (c) $x - 5$ (d) $10x$

(5) The number has no multiplicative inverse is .....

(a) 0 (b) 1 (c) 2 (d) 3

(6) * $x^2 - 4 =$ .....

(a) $4 - x^2$ (b) $(x-2)^2$ (c) $(x-2)(x+2)$ (d) $(x-4)^2$

3 **[a] Factorize :** (1) $x^4 + 4\ell^4$ (2) * $\frac{1}{8}a^3 - 8b^3$

[b] Find the solution set in $\mathbb{R}$ for : $6x^2 - x = 22$

4 **[a] Find in the simplest form :** $\frac{(\sqrt{3})^5 \times (\sqrt{3})^3}{(\sqrt{3})^4}$

[b] Find the positive real number which if added to its square the result will be 12

5 **[a]** A numbered card is selected randomly from a set of similar cards numbered from 1 to 24 **, find the probability of getting a card carries :**

(1) Odd number. (2) A number divisible by 3

[b] If $3^{x-4} = 1$ **, then find the value of :** x

8 El-Kalyoubia Governorate

Supervision of Math

Answer the following questions :

1 **Choose the correct answer :**

(1) If $2^x = 5$, then $8^x =$ .....

(a) 40 (b) 10 (c) 16 (d) 125

(2) If $\frac{x-5}{x-7} \in \mathbb{Q}$, then $x \neq$ .....

(a) 5 (b) – 5 (c) 7 (d) –7

(3) The solution set of the equation : $x^2 - 5x - 6 = 0$ in $\mathbb{R}$ is .....

(a) $\{2, 3\}$ (b) $\{2, 4\}$ (c) $\{1, -6\}$ (d) $\{-1, 6\}$

(4) $4^3 + 4^3 + 4^3 + 4^3 =$ .....

(a) 4^3 (b) 4^4 (c) 4^{12} (d) 4^{81}

(5) If $(x-5)^{zero} = 1$, then $x \in$ .....

(a) $\mathbb{R} - \{5\}$ (b) $\mathbb{R} - \{-5\}$ (c) $\{5\}$ (d) $\mathbb{R}$

(6) * If $x^2 - y^2 = 12$, $x - y = 3$, then $x + y =$ .....

(a) 3 (b) 4 (c) 12 (d) 15

2 **Complete each of the following :**

(1) $x(y + 3) + z(y + 3) =$ (.....) (.....)

(2) 25 % of L.E. 320 is L.E. .....

(3) If a die is thrown once , then the probability of appearance of an even prime number is .....

(4) The solution set of the equation : $x^2 + 4 = 0$ in $\mathbb{N}$ is .....

(5) $3\,(x^2\,y^3)^{zero}$ = ... (Where $x\,y \neq 0$)

---

3 **[a] Simplify :** $\dfrac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

[b] Factorize : (1) $x\,y + 5\,y + 3\,x + 15$ (2) * $4\,x^2 - 20\,x + 25$

---

4 **[a]** If $\left(\sqrt{3}\right)^{n+2} = 9$ **, find the value of :** n

[b] Factorize : (1) $x^4 + 4\,y^4$ (2) * $y^2 - 7\,y - 8$

---

5 **[a]** If a card is selected randomly of 30 cards in a box numbered from 1 to 30 **, Find the probability of getting :**

(1) A card carries a number divisible by 5

(2) A card carries a prime number less than 20

(3) A card carries an even number.

[b] If $x = 3$, $y = \sqrt{2}$ **, find in the simplest form the value of :**

(1) $x^{-2}\,y^{-4}$ (2) $\left(\dfrac{x}{y}\right)^{-3}$

9 El-Sharkia Governorate

Directorate of Education
Dep. of Governmental L.Schools

Answer the following questions :

1 **Complete each of the following :**

(1) If $3^{x-2} = 27$, then x = ...

(2) $\left(\dfrac{-2}{3}\right)^0$ = ...

(3) The S.S. of the equation : $x^2 + 9 = 0$ in $\mathbb{R}$, is .....

(4) If $6^x = 3$, then 6^{x+1} = ...

(5) If the probability that a student succeeds in a subject is 0.8 , then the probability of his failure is .....

---

2 **Choose the correct answer :**

(1) If $\dfrac{26}{x} + 1 = 14$, then x = ...

(a) 2 (b) 10 (c) 13 (d) 20

(2) If $3^{2n-5} = 1$, then $2n =$ .....

(a) 5 (b) -10 (c) 10 (d) zero

(3) A die is thrown once , then the probability of appearance number 7 is .....

(a) $\frac{1}{7}$ (b) zero (c) $\frac{1}{6}$ (d) 1

(4) The value of $(2)^{20} + (2)^{21}$ = ...

(a) 2^{41} (b) 4^{41} (c) 3×2^{20} (d) 3×2^{21}

(5) If $(x+3)^{zero} = 1$, then $x \in$ .....

(a) 3 (b) $\{-3\}$ (c) $\mathbb{R} - \{3\}$ (d) $\mathbb{R} - \{-3\}$

(6) * If $x^2 + k\,x - 21 = (x-3)(x+7)$, then $k =$ .....

(a) -4 (b) 4 (c) 8 (d) 20

3 **[a] Factorize each of the following expressions :**

(1) $x^3 + 2x^2 + 4x + 8$ (2) * $25a^4 - 1$

[b] If $\left(\frac{3}{5}\right)^{x-2} = \frac{27}{125}$ **Find the value of :** x

4 **[a] Find in $\mathbb{R}$ the S.S. of the equation :** $x(x+4)(2x-1) = 0$

[b] If $\frac{8^x \times 9^x}{18^x} = 64$ **Find the value of :** x

5 [a] Selecting randomly a card out of 40 similar cards in a box numbered from 1 to 40
Find the probability of getting a card carries :

(1) An even number. (2) A number is divisible by 3

(3) A prime number less than 20 (4) A number is not divisible by 10

10 El-Dakahlia Governorate

Maths Supervision

Answer the following questions :

1 **Complete each of the following :**

(1) If $3^{x-1} = 27$, then $x =$ .....

(2) If $(x-5)^0 = 1$, then $x \in$ .....

(3) $a + b = 2(x + y) = 14$, then $a(x + y) + b(x + y)$ = ...

(4) The probability of impossible event = ...

(5) If the perimeter of square x cm. , then its area = ...

2 **Choose the correct answer :**

(1) If $6^{x} = 7$, then 6^{x+1} = ...

(a) 8 (b) 13 (c) 36 (d) 42

(2) If the product of multiplying four by a number equals 48 , then the third of this number = ...

(a) 4 (b) 8 (c) 12 (d) 16

(3) The value of $2^{5} + \left(\sqrt{2}\right)^{10}$ = ...

(a) 2^{6} (b) 2^{10} (c) $\left(\sqrt{2}\right)^{15}$ (d) $\left(\sqrt{2}\right)^{20}$

(4) The S.S. of the equation : $x^{3} + 9x = 0$ in $\mathbb{R}$ is .....

(a) $\{0 , 3\}$ (b) $\{0\}$ (c) $\{0 , 3\}$ (d) $\{0 , 3 , -3\}$

(5) If $2^{x} = 5$, then 8^{x} = ...

(a) $\frac{5}{8}$ (b) 25 (c) 125 (d) $\frac{64}{125}$

(6) * If $y^{3} - a = (y - 2)(y^{2} + 2y + 4)$, then a = ...

(a) 2 (b) 4 (c) 8 (d) – 8

---

3 **Factorize :**

(1) $x^{4} + y^{4} - 11x^{2}y^{2}$ (2) $9x^{2} - 4a^{2} + y^{2} + 6xy$

(3) $3x^{3} - 2x^{2} + 12x - 8$ (4) * $25x^{2} - 30x + 9$

---

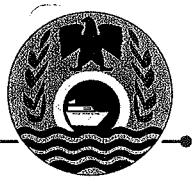
4 **[a]** If the length of a rectangle 5 cm. more than its width and its area 36 cm^{2}. **Find its perimeter.**

[b] If $\left(\sqrt{\frac{2}{3}}\right)^{x} = \frac{4}{9}$ **Find the value of :** $\left(\frac{2}{3}\right)^{x-1}$

---

5 **[a] Prove that :** $\frac{(27)^{x-1} \times 8^{x}}{\left(2\sqrt{3}\right)^{2x} \times \left(3\sqrt{2}\right)^{2x}} = \frac{1}{27}$

[b] A team plays 30 matches in national league , its drawn probability is 0.3 and its win probability is 0.6 **Calculate the number of loss matches.**



Answer the following questions :

1 **Complete each of the following :**

(1) $4a(x + y) - 3b(x + y) = (x + y)$ (..... – .....)

(2) The S.S. of the equation : $x^{2} + 3x = 0$ in $\mathbb{R}$ is .....

(3) If $3^{x} = 27$, then $x =$ .....

(4) The probability of impossible event is .....

(5) If the probability of absent pupils in a school is $\frac{2}{19}$, then the probability of present pupils is .....

---

2 Choose the correct answer :

(1) If $(x-5)^{zero} = 1$, then $x \in$ .....

(a) $\mathbb{R} - \{5\}$ (b) $\mathbb{R} - \{-5\}$ (c) $\{5\}$ (d) $\mathbb{R}$

(2) The S.S. in $\mathbb{R}$ of the equation : $x^2 + 25 = 0$ is .....

(a) $\{5\}$ (b) $\{5, -5\}$ (c) $\varnothing$ (d) $\{-5\}$

(3) If $5^{x} = 2$, then $5^{x+2} =$ .....

(a) 25 (b) 2 (c) 50 (d) 100

(4) A bag contains 20 balls , 8 out of them are white and the rest are black then the probability of drawn ball is black is .....

(a) 1 (b) 0.6 (c) 0 (d) $\frac{8}{20}$

(5) Which of the following can be probability of an event .....

(a) 1.2 (b) $\frac{4}{3}$ (c) -0.2 (d) 37 %

(6) * If $x^2 - a = (x-3)(x+3)$, then a = ...

(a) 3 (b) –3 (c) 9 (d) –9

---

3 [a] Factorize : (1) $x^3 - 3x^2 + 6x - 18$ (2) * $3x^3 - 81$

[b] If $\left(\frac{2}{5}\right)^{2x-1} = \frac{8}{125}$ **Find the value of :** x

---

4 [a] A positive real number if you add its square to its three times the result will be 28 find the number.

[b] Find in $\mathbb{R}$ the S.S. of : $x^2 - 8x = -15$

---

5 [a] If a card is chosen randomly from 10 cards numbered from 1 to 10 **, then the probability of chosen card is :**

(1) Even number. (2) Divisible by 3

(3) Even prime.

[b] Prove that : $\frac{(27)^{x-1} \times 8^{x}}{\left(2\sqrt{2}\right)^{2x} \times \left(3\sqrt{3}\right)^{2x}} = \frac{1}{27}$

12 Damietta Governorate

Inspection of mathematics

Answer the following questions :

1 Choose the correct answer from those given :

① 3^{-2} = ...

(a) –9 (b) $\frac{1}{9}$ (c) $-\frac{1}{9}$ (d) 9

② $\sqrt{100-64} = 10 -$ .....

(a) 4 (b) 6 (c) 8 (d) – 6

③ If a coin thrown once , then the probability of appearing tail = ...

(a) 1 (b) 0.3 (c) 0.5 (d) 0

④ The solution set of the equation : $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

(a) $\{3\}$ (b) $\{-3\}$ (c) $\varnothing$ (d) $\{3 , -3\}$

⑤ $4^3 + 4^3 + 4^3 + 4^3$ = ...

(a) 4^3 (b) 4^4 (c) 4^{12} (d) 4^{81}

⑥ * The expression : a $x^2 - 40x + 25$ is a perfect square when a = ...

(a) 2 (b) 4 (c) 9 (d) 16

---

2 Complete each of the following :

① If the probability that a pupil succeed is 0.8 , then probability of his failure = ...

② If $7^x = 1$, then x = ...

③ $2 \times 6 - 8 \div 4$ = ...

④ If $2^x = 5$, then 2^{-x} = ...

⑤ If $x - y = 3$ and $x + y = 4$, then $x^2 - y^2$ = ...

---

3 [a] Simplify : $\dfrac{\left(\sqrt{3}\right)^{8} \times \left(\sqrt{3}\right)^{-14}}{\left(\sqrt{3}\right)^{-4}}$

[b] Find the solution set of the following equation in $\mathbb{R}$: $x^2 - 8x = -15$

---

4 [a] Factorize each of the following expressions :

① * $x^2 - 4y^2$ ② $x^4 + 4y^4$

[b] Find the solution set of the following equation in $\mathbb{R}$: $3^{x-4} = 9$

5 **[a]** If $a = \sqrt{2}$, $b = \sqrt{3}$, **find the numerical value of :** $\frac{b^4 - a^4}{b^2 + a^2}$

[b] A box contains 5 white , 2 red , 3 green balls , a ball is drawn randomly from the box

Calculate the probabilities of the following events :

① The ball is white. ② The ball yellow. ③ The ball is not red.

13 El-Beheira Governorate

General Maths Supervision

Answer the following questions :

1 **Choose the correct answer :**

① If four times a number is 48 , then one third of this number equals .....

(a) 4 (b) 8 (c) 12 (d) 16

② $4^3 + 4^3 + 4^3 + 4^3 =$ .....

(a) 4^3 (b) 4^4 (c) 4^{12} (d) 4^{81}

③ If $6^x = 7$, then $6^{x+1} =$ .....

(a) 8 (b) 13 (c) 36 (d) 42

④ If 2 is a solution for the equation : $x^2 - 5x + a = 0$, then a = ...

(a) -3 (b) -6 (c) 6 (d) 3

⑤ If $x(x-2)^2 = 0$, then $x \in$ .....

(a) $\{2\}$ (b) $\{0 , -2\}$ (c) $\{0\}$ (d) $\{0 , 2\}$

⑥ ✻ The expression : $x^2 - 3x + c$ can be factorized , then c can be equal to .....

(a) 1 (b) 2 (c) 4 (d) 6

2 **Complete each of the following :**

① The simplest form of the expression : $2^{zero} + 2^{-1} - \left(\frac{-1}{\sqrt{2}}\right)^2 =$ .....

② If $x + y = 5$, $a - 2b = 4$, then $a(x + y) - 2b(x + y) =$ .....

③ If the age of Zyad now is x year , then his age before 3 years was ..... years.

④ If $x = \left(\sqrt{2} + 3\right)^5$, $y = \left(\sqrt{2} + 3\right)^{-5}$, then $xy =$ .....

⑤ A die is thrown once , then the probability of appearance odd prime number is .....

3 **[a] Find the S.S. of the following equation in $\mathbb{R}$:** $(x - 3)(x + 1) = 5$

[b] Find the positive real number if we add its square to its three times the result will be 28

4 **[a]** If $\left(\frac{2}{3}\right)^{x-4} = 2\frac{1}{4}$, **then find the value of :** x

[b] Simplify to the simplest form : $\frac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

---

3 **[a] Factorize each of the following :**

① $x^3 - x^2 + x - 1$ ② * $x^2 - 5xy - 24y^2$

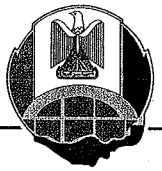
[b] A team plays 30 matches in a general league , its draw probability is 0.3 and its win probability is 0.6

Find : ① The expected number of draw matches.

② The expected number of lose matches.

14 El-Fayoum Governorate

Directorate of Education
Supervision of Mathematics



Answer the following questions :

1 **Choose the correct answer :**

① If $\frac{a}{b} = 1$, then $4a - 4b =$ .....

(a) 8 (b) 4 (c) 1 (d) 0

② If the probability that a pupil succeeds is 0.7 , then the probability of his failure is .....

(a) 0.7 (b) 0.07 (c) 0.3 (d) 0.03

③ If the age of Ahmed now is x years , then the square of his age is ..... years.

(a) x^2 (b) $2x$ (c) $2x^2$ (d) $x + 2$

④ $(-1)^3 + (-1)^5 =$ .....

(a) 0 (b) -2 (c) 2 (d) 201

⑤ $(5a)^0 =$ ..... , $a \neq 0$

(a) 5 (b) a (c) 5 a (d) 1

⑥ * If $x - 2y = 3$, $x^2 - 4y^2 = 21$, then $x + 2y =$ .....

(a) 14 (b) 9 (c) 7 (d) 6

---

2 **Complete each of the following :**

① $\frac{3}{4} =$ ..... %

② If $a = 7^x$, $b = 7^{-x}$, then $a \times b =$ .....

(3) $2^{-3} \times 2^{-2} \div 4^{-3} =$ .....

(4) The solution set of the equation : $x^2 - 6x = 0$ in $\mathbb{R}$ is .....

(5) If a fair coin is tossed once , then the probability of appearance of a head = ...

---

3 **[a] Factorize each of the following completely :**

(1) $36 - 60k + 25k^2$ (2) $x^4 + 64$

[b] Find in $\mathbb{R}$ the S.S. of the following equation : $x^2 + x = 6$

---

4 **[a] Simplify to the simplest form :** $\dfrac{(\sqrt{5})^{10} \times (-\sqrt{5})^5}{(\sqrt{5})^{11}}$

[b] A regular die is thrown once **Find the probability of the appearance a number :**

(1) Even. (2) Between 0 and 6 (3) Prime.

---

5 **[a] Find in $\mathbb{R}$ the S.S. of the following equation :** $2^{n-3} = \dfrac{1}{4}$

[b] Simplify to the simplest form : $\dfrac{4^{x+1} \times 9^{2-x}}{6^{2x}}$, then calculate its value at $x = 1$

15 Aswan Governorate

Aswan Educational Directorate
M.M. Yackoub Language Experimental school

Answer the following questions :

1 **Complete each of the following :**

(1) If $a(x + y) - b(x + y) = 15$ and $x + y = 5$, then $a - b =$ .....

(2) The multiplicative inverse of $\left(-\frac{2}{3}\right)^3$ is .....

(3) $\frac{3}{5} + \frac{2}{5} =$ ..... %

(4) If $3^{x-2} = 1$, then $x =$ .....

(5) $x^2 - x = x$ (.....)

---

2 **Choose the correct answer :**

(1) The S.S. of the inequality $x \leq 0$ in $\mathbb{N}$ is .....

(a) $\{0\}$ (b) $\{-1\}$ (c) $\varnothing$ (d) $\mathbb{N}$

(2) $\left(\frac{\sqrt{5}}{3}\right)^{-2} =$ .....

(a) $\frac{-9}{5}$ (b) $\frac{-5}{9}$ (c) $\frac{5}{9}$ (d) $\frac{9}{5}$

(3) If $x^3 y^{-3} = 8$, then $\frac{y}{x}$ = ...

(a) $\frac{1}{512}$ (b) $\frac{1}{8}$ (c) $\frac{1}{2}$ (d) 2

(4) The S.S. of the equation : $x(x-2) = 0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{2\}$ (c) $\{0, 2\}$ (d) $\{0, -2\}$

(5) If the probability that a student succeeds in a subject is 80%
, then the probability of his failure is .....

(a) 0.08 (b) 0.02 (c) 0.2 (d) 0.8

(6) * If the expression : $x^2 + 14x + b$ is a perfect square , then b = ...

(a) 0 (b) 49 (c) ± 9 (d) 7

---

3 **[a]** If : $\frac{8^x \times 9^x}{(18)^x} = 64$, **find the value of :** $(4)^{-x}$

[b] Factorize : (1) $9x^2 - 3x$ (2) * $-9x^2 + 25$

---

4 **[a] A regular die is drawn once , find the probability of the following events :**

(1) Appearance a number divisible by 7

(2) Appearance a prime number ≤ 4

[b] Find in $\mathbb{R}$ the S.S. of the equation : $x(x-2) - 3(2-x) = 0$

---

5 **[a] Factorize :**

(1) $ax - 7a + 3x - 21$ (2) * $3x^2 + 7y - 6$

[b] If $3^x = 27$, $4^{x+y} = 1$, **find the value of each of x and y**

1 Cairo Governorate

Ain Shams directorate

Answer the following questions :

1 Complete :

(1) The simplest form of $\left(\frac{3}{5}\right)^{-2}$ is .....

(2) If $2^{x} + 2^{x} = 1$, then $x =$ .....

(3) The S.S. of : $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

(4) A die is thrown once , then the probability of appearance of an odd prim number is .....

(5) If $x^2 - y^2 = 14$, $x - y = 2$, then $x + y =$ .....

---

2 Choose the correct answer :

(1) One third of 3^{15} is .....

(a) 3^5 (b) 9^{15} (c) 9^5 (d) 3^{14}

(2) The S.S. of : $x(x-2) = 0$, in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{2\}$ (c) $\{0 , 2\}$ (d) $\{0 , -2\}$

(3) If -2 is a solution for the equation : $x^2 - 3x = k$, then $k =$ .....

(a) -10 (b) ± 10 (c) -2 (d) 10

(4) If $x^2 + kx + 36$ is a perfect square trinomial , then $k =$ .....

(a) 12 (b) -12 (c) 0 (d) ± 12

(5) $3^5 \times \left(\sqrt{3}\right)^{10} =$ .....

(a) 3^6 (b) 3^{10} (c) $\left(\sqrt{3}\right)^{15}$ (d) $\left(\sqrt{3}\right)^{2}$

---

3 [a] Find in $\mathbb{R}$ the S.S. of : $2x^3 = 8x$

[b] Simplify : $\frac{4^{n+1} \times 9^{2-n}}{6^{2n}}$ **, then find it value at :** $n = 1$

---

4 Factorize each of the following completely :

(1) $L^4 + 4m^4$ (2) $ax + bx + ay + by$

(3) $\frac{1}{3}L^3 + 9$ (4) $7a^4 + 23a^2b - 30b^2$

5 [a] A rectangle its area is 14 cm^2 and its length is 5 cm. more than its width.

Find its perimeter.

[b] A numbered card is selected randomly from a set of similar cards numbered from 1 to 30

Find the probability of getting a card carries :

(1) A multiple of 6 (2) A number is divisible by 25

(3) A positive integer less than 30

2 Cairo Governorate

Rod El-Farag Educational Zone
St. Mary's School

Answer the following questions :

1 Choose the correct answer :

(1) The S.S. of the equation : $x^2 - 1 = 8$ in $\mathbb{R}$ is .....

(a) $\varnothing$ (b) $\{3\}$ (c) $\{-3\}$ (d) $\{-3, 3\}$

(2) If $6^x = 7$, then 6^{x+1} = ...

(a) 8 (b) 13 (c) 36 (d) 42

(3) Let $x^2 + k\,x + 25$ be a perfect square , then k = ...

(a) 5 (b) 10 (c) ± 5 (d) ± 10

(4) The value of the expression : $3^5 + \left(\sqrt{3}\right)^{10} - 2\,(3)^5$ = ...

(a) zero (b) 3^5 (c) $\left(\sqrt{3}\right)^5$ (d) $2\,(3)^5$

(5) If a die is thrown once , then the probability of appearance 5 on the upper face is .....

(a) $\frac{-5}{6}$ (b) zero (c) $\frac{1}{6}$ (d) $\frac{5}{6}$

2 Complete :

(1) If $2^x = 32$, then x = ...

(2) $4^y + 4^y + 4^y + 4^y = 1$, then y = ...

(3) If $5^{x-3} = 1$, then x = ...

(4) $a\,x + b\,x + a\,y + b\,y = (a + b)$ (..... + ...)

(5) If $x = \left(\sqrt{5} + 6\right)^9$, $y = \left(\sqrt{5} + 6\right)^{-9}$, then $x\,y$ = ...

3 **[a] Factorize :** $3\,a\,x - a - 6\,b\,x + 2\,b$

[b] Factorize : $x^4 + x^2 y^2 + 25\,y^4$

---

4 **[a] Find in $\mathbb{R}$ the S.S. of the equation :** $\left(\frac{5}{3}\right)^{x+2} = \frac{27}{125}$

[b] The ratio between two positive numbers is 2 : 3 and their product is more than twice the greater by 12 , find the two numbers.

---

5 **[a] Prove that :** $\frac{(27)^{x-1} \times (8)^x}{\left(2\sqrt{2}\right)^{2x} \times \left(3\sqrt{3}\right)^{2x}} = \frac{1}{27}$

[b] A bag contains balls labeled by the numbers from 1 to 24 , if a ball is drawn at random.

Find the probability of each of the following :

(1) The drawn ball carries a number divisible by 5

(2) The drawn ball carries a perfect square number.

Additional question

[a] Choose the correct answer :

(1) If $x^3 - y^3 = 24$, $x^2 + x\,y + y^2 = 8$, then $x - y =$ .....

(a) 4 (b) 6 (c) 3 (d) 12

(2) If $(x + 8)$ is a factor of the expression : $x^2 + 6\,x - 16$, then the other factor is .....

(a) $x - 2$ (b) $x - 4$ (c) $x + 2$ (d) $x + 4$

[b] Factorize each of the following :

(1) $x^2 - 5\,x - 36$ (2) $4\,x^2 - 25\,y^2$

3 Cairo Governorate

East Nasr City Educational Zone
Mathematics Inspection

Answer the following questions :

1 **Choose the correct answer from the given ones :**

(1) $(x - 2)(x^2 + 2\,x + 4) =$ .....

(a) $x^3 + 8$ (b) $x^3 - 8$ (c) $x^3 + 4$ (d) $x^3 + 2$

(2) If a die is thrown once , then the probability that the number 5 appears is .....

(a) $\frac{5}{6}$ (b) $\frac{1}{2}$ (c) $\frac{1}{6}$ (d) $\frac{0}{6}$

(3) If $7^{x-3} = 5^{x-3}$, then $x =$ .....

(a) 5 (b) 7 (c) 3 (d) 0

(4) $4 \times 15 \div 12 - 5 =$ .....

(a) -2 (b) 0 (c) 2 (d) 1

(5) $x^4 + 4$ can be factorize by completing square by adding .....

(a) $4x$ (b) $-x^2$ (c) $\pm 4x^2$ (d) $-2x^2$

2 Complete :

(1) $\left(\frac{3}{5}\right)^x = \frac{27}{125}$, then $x =$ .....

(2) The solution set of the equation : $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

(3) If the probability that a student failed is 7 % , then the probability that this student succeeded is .....

(4) If $3^x = 81$, then $x =$.....

(5) If $a^2 + 2ab + b^2 = 25$, then $(a + b) =$ .....

3 [a] Factorize :

(1) $ax + bx + ay + by$ (2) $4x^4 + 1$

[b] Find in $\mathbb{Q}$ the solution set of :

(1) $(x^2 + 3)(x^3 + 1) = 0$ (2) $4x^2 - 25 = 0$

4 [a] If $\frac{8^x \times 9^x}{18^x} = 64$ **, find :** x

[b] A rectangle its length exceeds its width by 5 cm. and its area is 14 cm^2. Find its dimensions.

5 [a] A box contains a similar balls , 8 white balls , 5 red balls and 7 black balls , if we choose a ball , then find the probability that the ball is :

(1) White. (2) Black or red.

[b] A rational number , if subtracted from it double its multiplicative inverse the result equals one. Find this number.

Additional questions

[a] Complete each of the following :

(1) $5x^2 + x - 6 = (\ldots\ldots + \ldots\ldots)(x - \ldots\ldots)$

(2) The expression : $x^2 - kx + 4$ is a perfect square , if k = ...

[b] Factorize each of the following :

(1) $x^2 + 7x + 12$ (2) $6x^2 - 7x - 3$

4 Giza Governorate

Omrania Directorate
ELSadat Governmental language School

Answer the following questions :

1 Complete each of the following :

(1) The simplest form of $\left(\frac{2}{3}\right)^{-2}$ is .....

(2) The probability of the impossible event = ...

(3) If $2^x = 5$, then 2^{x+1} = ...

(4) The age of a man now x years , then his age 7 years ago is ..... years.

(5) $x(a + b) + y(a + b) = (a + b)(\ldots\ldots)$

2 Choose the correct answer :

(1) The solution set of the equation : $x^2 + 25 = 0$ in $\mathbb{R}$ is .....

(a) $\{5, -5\}$ (b) $\{5\}$ (c) $\{-5\}$ (d) $\varnothing$

(2) $4^3 + 4^3 + 4^3 + 4^3$ = ...

(a) 4^3 (b) 4^4 (c) 4^{12} (d) 4^{81}

(3) If a die is thrown once , then the probability of appearance number 7 is .....

(a) zero (b) 0.7 (c) 0.6 (d) 1

(4) $(5^2)^3$ = ...

(a) 5^{23} (b) 5^5 (c) 5^6 (d) 5

(5) If $(3)^{x+4} = 1$, then x = ...

(a) 4 (b) – 4 (c) 5 (d) 3

3 **Factorize each of the following :**

(1) $a\,x - 4\,a + 3\,x - 12$ (2) $x^4 + 4$

---

4 **[a] Find in $\mathbb{R}$ the S.S. if the following equation :** $x^2 - 5x + 6 = 0$

[b] Simplify : $\dfrac{2^x \times 4^{x+1}}{8^x}$

---

5 **[a] Find the value of x if :** $2^{x-2} = 16$

[b] A box contains 3 red balls , 4 yellow balls and 5 green balls.

A ball is drawn randomly from the box.

Find the probability of the drawn ball is :

(1) Yellow. (2) Green. (3) Not red.

Additional question

[a] Complete the following :

(1) If $x^2 + a\,x - 13 = (x + 1)(x - 13)$, then a = ...

(2) If $k \in \mathbb{Z}$, $x^2 + k\,x - 3$ can be factorized , then k = ...

[b] The area of a rectangle is $(x^2 + 8x + 15)$ cm^2 and its width is $(x + 3)$ cm.

Find its length in terms of x , then find its perimeter in terms of x

5 Giza Governorate

Dokki District
Modern Narmer Language School

Answer the following questions :

1 **Complete the following :**

(1) If $a(x + y) - b(x + y) = 15$, $x + y = 5$, then a – b = ...

(2) If $x^2 - y^2 = 35$, $x - y = 7$, then $x + y$ = ...

(3) The number $\left(\sqrt{2}\right)^{-3}$ in the simplest form is .....

(4) If $3^{x-2} = 9$, then x = ...

(5) A bag contains 10 cards numbered from 1 to 10 , the probability of choosing a card that carries a prime number is .....

2 Choose the correct answer :

(1) The expression : $x(y + 3) + z(y + 3) =$ .....

(a) $x + y + z + 6$ (b) $(x + z)(y + 3)$ (c) $(x + z)(y + 3)^2$ (d) $(x + z) \times 2(y + 3)$

(2) If $3^x + 3^x + 3^x = 1$, then $x =$ .....

(a) -1 (b) 0 (c) 1 (d) 2

(3) If $3^x = 5$, then $(27)^x =$ .....

(a) 9 (b) 25 (c) 125 (d) 729

(4) $2^{12} \times 3^{12} =$ .....

(a) 6^2 (b) 6^4 (c) 6^{12} (d) 6^{24}

(5) If a die is thrown once , then the probability that 5 appears is .....

(a) $-\frac{5}{6}$ (b) zero (c) $\frac{1}{6}$ (d) $\frac{5}{6}$

---

3 [a] Factorize completely :

(1) $Lx - 7L + 3x - 21$ (2) $x^4 - x^2 - 5x + 5$

[b] Using factorization to find the value of : $36^2 - 36 \times 16$

---

4 [a] Simplify : $\frac{4^m \times 6^{2m}}{2^{4m} \times 3^{2m}}$

[b] If a number x is decreased by twice its multiplicative inverse , the result is 1 **Find :** x

---

5 [a] Find the value of x if : $3^{2x-3} = 243$

[b] A bag contains 20 balls numbered from 1 to 20 , if one ball is drawn at random **, then find the probability that :**

(1) The number is a multiple of 4 (2) The number is less than or equal 7

Additional question

[a] Choose the correct answer :

(1) If $x^3 + y^3 = 9$, $2x + 2y = 6$, then $x^2 - xy + y^2 =$ .....

(a) 3 (b) 9 (c) 27 (d) 54

(2) The number which can be added to the expression : $2x^2 + 5x - 10$ to be factorized is .....

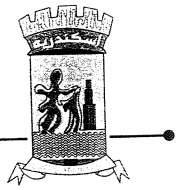
(a) -1 (b) -2 (c) -3 (d) -4

[b] Factorize each of the following :

(1) $2(x^2 - 2) - 7x$ (2) $x^2 - 25$

6 Alexandria Governorate

Middle Educational Zone
Mathematics Inspection



Answer the following questions :

1 Choose the correct answer :

(1) The S.S. of the equation : $x(x-5)=0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{5\}$ (c) $\{0, 5\}$ (d) $\{0, -5\}$

(2) If $5^{x-4} = 3^{x-4}$, then $x =$ .....

(a) 4 (b) -4 (c) zero (d) 35

(3) The probability of a certain event = ...

(a) zero (b) 1 (c) -1 (d) -2

(4) If $\left(\frac{3}{5}\right)^{x} = \frac{27}{125}$, then $x =$ .....

(a) -3 (b) 3 (c) $\frac{3}{5}$ (d) zero

(5) Which of the following may be equal a probability of an event ?

(a) $\frac{-3}{4}$ (b) 1.7 (c) $\frac{7}{5}$ (d) 60 %

2 Complete each of the following :

(1) If $x y^{-1} = \frac{1}{3}$, then $\frac{x}{y} =$ .....

(2) If $5^{x} = 3$, then $5^{x+1} =$ .....

(3) If the probability that a student succeeds in an exam is 0.8 , then the probability of his failure is .....

(4) If $x \in \mathbb{R}$, then the S.S. of equation : $x^2 + 49 = 0$ is .....

(5) The age of a man now is x years , then his age after 7 years is ..... years.

3 [a] Factorize each of the following :

(1) $xy + 5y + 3x + 15$ (2) $x^4 + 4y^4$

[b] If a real number is added to its square the result will be 12 , find this number.

4 [a] Find in $\mathbb{R}$ the S.S. of the equation : $x^3 - 25x = 0$

[b] Simplify to the simplest form : $\frac{3^{x} \times 6^{x}}{18^{x}}$

5 [a] A box contains 5 blue balls , 7 red balls and 8 green balls.
A ball is drawn randomly from the box.

Find the probability of getting :

(1) Red ball. (2) Non-blue ball. (3) White ball.

[b] If $3^{x-4} = 243$

Find the value of : x

Additional question

[a] Choose the correct answer :

(1) If $\ell + m = 9$, $m - \ell = -6$, then $\ell^2 - m^2 =$ .....

(a) 54 (b) 14 (c) -54 (d) -14

(2) If $x^2 - 2xy + y^2 = 36$, then $x - y =$ .....

(a) 18 (b) -6 (c) 6 (d) ± 6

[b] Factorize completely :

(1) $2x^3 + 16$ (2) $7x^4 + 23x^2y - 30y^2$

7 El-Kalyoubia Governorate

Directorat of Education
Mathematics Inspection

Answer the following questions :

1 Choose the correct answer :

(1) If $x^3 \times y^{-3} = 8$, then $\frac{x}{y} =$ .....

(a) $\frac{8}{3}$ (b) 2 (c) $\frac{1}{2}$ (d) 512

(2) The S.S. of the equation : $x(x-2) = 0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{2\}$ (c) $\{0 , 2\}$ (d) $\{0 , -2\}$

(3) If $\left(\frac{5}{3}\right)^x = \frac{27}{125}$, then $x =$ .....

(a) -5 (b) -3 (c) 5 (d) 3

(4) $4^3 + 4^3 + 4^3 + 4^3 =$ .....

(a) 4^4 (b) 4^{12} (c) 16^3 (d) 16^{12}

(5) $2^2 \times 5^3 =$ .....

(a) $\frac{1}{2} \times 10^3$ (b) 10^3 (c) 10^5 (d) 10^6

2 **Complete each of the following :**

(1) The S.S. of the equation : $x^2 - 3 = 0$ in $\mathbb{R}$ is .....

(2) The S.S. of the equation : $(x^2 + 4)(x^3 + 1) = 0$ in $\mathbb{R}$ is .....

(3) $(-5)^{-3}$ = ...

(4) If $2^x = 3$, then 8^x = ...

(5) Letters of the word (Elkliobia) are written in cards. If a card is drawn , then the probability that chosen card carries the latter "i" = ...

---

3 **[a] Factorize the following expression :** (1) $x^2 - 5x$ (2) $ax - 7a + 3x - 21$

[b] If $a = \sqrt{10}$, $b = 1$ **Find the numerical value of :** $a^4 + b^{10}$

---

4 **[a] Find the S.S. of the equation :** $(2x - 3)(x + 1) = 0$, $x \in \mathbb{R}$

[b] Simplify : $\dfrac{(\sqrt{2})^5 \times 3^6}{3^4 \times (\sqrt{2})^3}$ to the simplest form.

---

5 **[a]** The length of a rectangle exceeds its width by 1 cm. , if its perimeter = 14 cm. Calculate its area.

[b] A regular die is drawn once. Find the probability of getting :

(1) A number divisible by 8 (2) A prime number less than 4

Additional question

[a] Complete each of the following :

(1) If $x^2 - k + 10 = (x - 3)(x + 3)$, then k = ...

(2) If $x = 3$, $y = 8$, then $x^2 - 2xy + y^2$ = ...

[b] Use factorization to get the value of : $(80)^2 + 40 \times 80 + 400$

8 El-Sharkia Governorate

Directorate of Education
Dept. of Governmental L. Shools

Answer the following questions :

1 **Choose the correct answer :**

(1) If $(x - 2)^0 = 1$, then $x \in$ .....

(a) $\{2\}$ (b) $\mathbb{R}$ (c) $\mathbb{R} - \{2\}$ (d) $\mathbb{R} - \{-2\}$

(2) If $5^{x} = 4$, then 5^{x-1} = ...

(a) 0.8 (b) 1.25 (c) 0.125 (d) 0.08

(3) The S.S. of the equation : $x^2 + 1 = 0$ in $\mathbb{R}$ is .....

(a) $\{-1\}$ (b) $\{1\}$ (c) $\{1, -1\}$ (d) $\varnothing$

(4) The probability of impossible event is .....

(a) $\varnothing$ (b) -1 (c) zero (d) 1

(5) The value of $\left(\sqrt{x}\right)^{16} = x$ .....

(a) 16 (b) 8 (c) 4 (d) 32

2 Complete :

(1) 5^{x+2} = ... $\times 25$

(2) If $x^3 y^{-3} = 8$ then $\frac{y}{x}$ = ...

(3) If a die is thrown once , then the probability of appearance 5 is .....

(4) $a^{-7} + 1 = a^{-7}$ (..... + ...)

(5) $3^{x} \times 3^{x} \times 3^{x} = (27)^{.....}$

3 [a] Factorize each of the following :

(1) $a^2 + ab + a + b$ (2) $x^4 + 4y^4$

[b] Find in $\mathbb{R}$ the S.S. of the equation : $(2x + 1)(x - 3) = 0$

4 [a] Find the value of x if : $3^{x-2} = 27$

[b] Find in the simplest form : $\frac{4^{x+1} \times 3^{2x-3}}{6^{2x}}$

5 [a] If $2^{x-3} = 1$ **Find the value of :** x^2

[b] If a card is selected randomly of 30 cards in a box numbered from 1 to 30

Find the probability of getting :

(1) A card carries a number divisible by 5

(2) A card carries a prime number less than 20

(3) A card carries an even number.

Additional question

[a] Choose the correct answer :

(1) If $(X+1)^2$ is a factor of the expression $(X^2-1)^2$, then the other factor is .....

(a) $X-1$ (b) X^2-1 (c) X^2+1 (d) $(X-1)^2$

(2) If $X=7$, $y=3$, then $X^2+2Xy+y^2=$ .....

(a) 10 (b) 4 (c) 100 (d) 16

[b] Factorize each of the following :

(1) $3X^2+10X+8$ (2) $\frac{1}{3}X^3-9$

9 El-Gharbia Governorate

Official Language Schools
The Central Maths Supervision

Answer the following questions :

1 Choose the correct answer :

(1) If a die is thrown once , then the probability of appearance odd prime number is .....

(a) 0 (b) $\frac{1}{6}$ (c) $\frac{1}{3}$ (d) $\frac{1}{2}$

(2) If $7^X=49$, then $X=$ .....

(a) 0 (b) -2 (c) -7 (d) 2

(3) Which of the following may be equal the probability of an event ?

(a) -0.73 (b) 1.23 (c) 79% (d) $\frac{4}{3}$

(4) $3^{10}+3^{10}+3^{10}=$ .....

(a) 3^{30} (b) 3^{1000} (c) 3^{11} (d) 3^{12}

(5) One sixth of the number : $2^{12}\times3^{12}$ is .....

(a) 6^2 (b) 6^4 (c) 6^{11} (d) 6^{23}

2 Complete :

(1) 1 , 1 , 2 , 3 , 5 , 8 , ... , ... (in the same pattern)

(2) If $3^X\times2^{-X}=1.5$, then $X=$ .....

(3) The S.S. of the equation : $(x-1)^2 = 0$ in $\mathbb{R}$ is .....

(4) If $6^x = 11$, then 6^{x+1} = ...

(5) The probability of the impossible event = ...

3 [a] **Factorize each of the following :**

(1) $y^3 + y^2 + 9y + 9$ (2) $4x^4 + y^4$

[b] **Find in the simplest form :** $\left(\sqrt{3}+2\right)^{11}\left(\sqrt{3}-2\right)^{11}$

4 [a] If $\frac{8^x \times 9^x}{18^x} = 64$ **Find the value of :** $(4)^{-x}$

[b] What is the positive real number if we add its square to three times it the result will be 28 ?

5 [a] The set $\{2, 3, 5\}$ is used to write a number which consists of two different digits

(1) Write the sample space.

(2) **Find the probability of the following events :**

First : The units digit is an even number.

Second : The sum of the two digits greater than 5

[b] **Find the value of x if :** $7^{x-2} = 1$, where $x \in \mathbb{R}$

Additional question

[a] **Complete the following :**

(1) If $x - y = 3$, $x - 2y = 7$, then $x^2 - 3xy + 2y^2$ = ...

(2) $\ell^2 - m^2 = \ell + m$, then $\ell - m$ = ...

[b] **Use factorization to get the value of :** $(73)^2 - (27)^2$

10 El-Dakahlia Governorate

Maths Supervision

Answer the following questions :

1 **Complete each of the following :**

(1) If $x^3 y^{-3} = 8$, then $\frac{y}{x}$ = ...

(2) If $x^2 + y^2 = 26$, $x + y = 6$, then xy = ...

(3) $3^{x-1} + 3^{x-1} + 3^{x-1} = 3$ .....

(4) If $2^x = \sqrt{3}$, then $16^x =$ .....

(5) If $(a + 2b) = 5$ $(a - 2b) = 10$, then $a^2 - 4b^2 =$ .....

2 Choose the correct answer :

(1) If $3^x = 5$, then $3^{x+2} =$ .....

(a) 10 (b) 15 (c) 45 (d) $\frac{5}{4}$

(2) The S.S. of the equation : $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{3\}$ (c) $\{3, -3\}$ (d) $\varnothing$

(3) If $x + \frac{1}{x} = 3$, then $x^2 + \frac{1}{x^2} =$ .....

(a) 9 (b) 11 (c) 7 (d) 1

(4) If the probability that a student succeeds in an exam is 0.8 , then the probability of his failure is .....

(a) $\frac{1}{5}$ (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) $\frac{2}{3}$

(5) If $x + 2y = 7$, $a - b = 3$, then $b(x + 2y) - a(x + 2y) =$ .....

(a) 10 (b) 21 (c) -21 (d) -10

3 Factorize :

(1) $4x^4 + 25y^4 - 29x^2y^2$ (2) $x^3 + 2x^2 - 4x - 8$ (3) $x^4 + 64$

4 [a] **Simplify :** $\frac{(9)^{x-1} \times (4)^{x+2}}{(6)^{2x}}$

[b] **Find in $\mathbb{R}$ the S.S. of the equation :** $x - \frac{3}{x} = 2$

5 [a] If $\left(\frac{3}{5}\right)^{x-2} = \frac{125}{27}$ **Find the value of :** x

[b] A box contains 24 identical cards numbered from 1 to 24 , a ball chosen randomly

Find the probability that :

(1) The chosen card carries number divisible by 6

(2) The chosen card carries a prime number.

11 Port Said Governorate

North Administration
Gov. School Directory

Answer the following questions :

1 Complete each of the following :

(1) If $x(x-2)=0$, then $x=0$ or $x=$ .....

(2) The solution set of : $x^2+4=0$ in $\mathbb{N}$ is .....

(3) $a(x+y)+b(x+y)=(x+y)=$ (..... + ...)

(4) The letters of the word (Egypt) are written in cards , if a card is drawn at random , then the probability that chosen card carries the letter "E" is .....

(5) $\left(\sqrt{3}+\sqrt{2}\right)^9\left(\sqrt{3}-\sqrt{2}\right)^9=$ .....

2 Choose the correct answer :

(1) $3^3+3^3+3^3=$ .....

(a) 3^3 (b) 3^4 (c) 3^9 (d) 4^{27}

(2) The probability of impossible event = ...

(a) 1 (b) 2 (c) 0 (d) $\frac{1}{2}$

(3) $\left(\frac{\sqrt{5}}{3}\right)^{-2}=$ .....

(a) $\frac{9}{5}$ (b) $\frac{-9}{5}$ (c) $\frac{-5}{9}$ (d) $\frac{5}{9}$

(4) If $(x-5)^{zero}=1$, then $x\in$ .....

(a) $\mathbb{R}$ (b) $\mathbb{R}-\{5\}$ (c) $\mathbb{R}-\{-5\}$ (d) $\{5\}$

(5) If $5x=20$, then $x=$ .....

(a) 4 (b) 8 (c) 15 (d) 20

3 [a] **Factorize the following expression :** $ax+bx+ay+by$

[b] **Find in $\mathbb{R}$ the S.S. of the equation :** $x^2+5x+6=0$

4 [a] If $3^{x-1}=9$, **then find the value of :** x

[b] **Simplify :** $\frac{4^x\times 2^{x+1}}{8^x}$

5 A bag contains 5 red balls , 3 green balls and 2 yellow balls. One ball is chosen at random , **find the probability that the chosen ball is :**

(1) Yellow. (2) Green. (3) Not red.

Additional question

[a] Choose the correct answer :

(1) If $x^2 + a = (x + 3)(x - 3)$, then a = ...

(a) 6 (b) 9 (c) -9 (d) -6

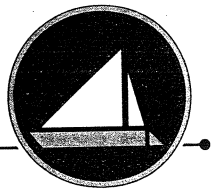
(2) The value of m which makes the expression : $m x^2 + 14 x + 1$ a perfect square is .....

(a) 7 (b) 14 (c) 49 (d) 16

[b] Factorize each of the following : (1) $\frac{1}{4} a^2 - 2a + 4$ (2) $2 - 2m^3$

12 Damietta Governorate

Damietta Inspection of Mathematics
Experimental at Language Schools



Answer the following questions :

1 Choose the correct answer :

(1) The probability of an impossible event = ...

(a) 2 (b) -1 (c) 1 (d) zero

(2) $x^4 + 4 = (x^2 + 2)^2$ .....

(a) $+2x^2$ (b) $-2x^2$ (c) $-4x^2$ (d) $+4x^2$

(3) A bird can travel 8 km. in 15 minutes , at this rate the bird can travel ..... km. in 1 hour.

(a) 32 (b) 16 (c) 120 (d) 60

(4) If $(x - 5)^0 = 1$, then $x \in$ .....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{5\}$ (c) $\mathbb{R} - \{-5\}$ (d) 5

(5) The solution set of the equation : $x^2 + 25 = 0$ in $\mathbb{R}$ is .....

(a) $\{5\}$ (b) $\{-5\}$ (c) $\{5, -5\}$ (d) $\varnothing$

2 Complete :

(1) 25% of L.E. 320 is L.E. .....

(2) If a die is thrown once , then the probability of appearance of an even prime number .....

(3) If $5^{x-2} = 1$, then $x =$ .....

(4) $\left(\frac{\sqrt{2}}{\sqrt{3}}\right)^{-4} = \left(\frac{\text{.....}}{\text{.....}}\right)^{2}$

(5) If $4a + 4b = 32$, then $3a + 3b =$ .....

3 [a] **Factorize each of the following :**

(1) $x^4 + 4y^4$ (2) $3ax - a + 6bx - 2b$

[b] **Simplify to the simplest form :** $\frac{9^x \times 4^x}{6^{2x}}$

4 [a] If $3^{x-1} = \frac{1}{27}$ **Find the value of :** x

[b] **Simplify :** $\frac{(\sqrt{5})^{x+2} \times (\sqrt{5})^{3x}}{(\sqrt{5})^{2x}}$ **, then find the value when** $x = 1$

5 [a] **Find the solution set of the equation in** $\mathbb{R}$ **:** $x^2 - x = 12$

[b] A box contains 7 red balls , 5 blue balls and 3 green balls , one is chosen randomly.

Find the probability of the chosen ball is :

(1) Green. (2) Yellow. (3) Not blue.

Additional question

[a] **Complete :**

(1) If $x + y = 5$, $x^2 - xy + y^2 = 7$, then $x^3 + y^3 =$ .....

(2) $(17)^2 + 2 \times 17 \times 3 + 3^2 =$ .....

[b] **Factorize each of the following perfectly :**

(1) $(x + 4)^2 - 36$ (2) $2y^4 + 3y^2 - 5$

13 El-Fayoum Governorate

Directorate of Education
Supervision of Mathematics

Answer the following questions :

1 **Choose the correct answer :**

(1) $(3)^{-2} =$ .....

(a) -9 (b) $-\frac{1}{9}$ (c) $\frac{1}{9}$ (d) 9

(2) If x is an even natural number , then the next odd natural number directly is .....

(a) $x + 1$ (b) $x + 2$ (c) $2x + 1$ (d) $2x$

(3) The S.S. of : $x(x-2)=0$ in $\mathbb{R}$ is .....

(a) $\{2\}$ (b) $\{0, -2\}$ (c) $\{0, 2\}$ (d) $\{0\}$

(4) If $\frac{x-5}{x-7} \in \mathbb{Q}$, then $x \neq$ .....

(a) 5 (b) -5 (c) 7 (d) -7

(5) $5^2 + 5^2 =$ .....

(a) 10^2 (b) 10^4 (c) 5^4 (d) 50

2 Complete each of the following :

(1) $(5a)^0 =$ ..... where $a \neq 0$

(2) The probability of the impossible event = ...

(3) If $3^{n-2} = 81$, then n = ... (4) $8 + 2 \times 6 \div 4 =$ .....

(5) For every event A , we find that : $0 \leq P(A) \leq$ .....

3 [a] Factorize each of the following completely : (1) $xy + 5y + 7x + 35$ (2) $x^4 + 4$

[b] Find in $\mathbb{R}$ the S.S. of the following equation : $x^2 - 6x = 0$

4 [a] If $a = \sqrt{2}$, $b = \sqrt{3}$

find (by steps) the numerical value of : $\frac{b^2 - a^4}{b^2 + a^2}$

[b] A card is selected randomly from a set of similar cards numbered from 1 to 10

find the probability of getting a card that carries :

(1) An even number. (2) A number divisible by 7

(3) A number less than or equal to 10

5 [a] Find in $\mathbb{R}$ the S.S. of the following equation : $2^{x^2-9} = 1$

[b] Simplify to the simplest form : $\frac{9^x \times 3^{x+2}}{(27)^x}$

Additional question

[a] Choose the correct answer :

(1) The expression : $x^2 - 3x + c$ can be factorized when c = ...

(a) 1 (b) 2 (c) 4 (d) 6

(2) If the expression : $c + 3x + \frac{1}{4}$ is a perfect square , then c = ...

(a) x^2 (b) $\frac{9}{4}x^2$ (c) $9x^2$ (d) $4x^2$

[b] Factorize each of the following :

(1) $x^2 - 4x - 3(x-2)$ (2) $\ell^3 - \frac{1}{125}$

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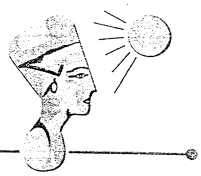
Governmental Language School
General Supervisor of Mathematics



Answer the following questions :

1 Complete :

(1) $\left(\frac{1}{4}\right)^{-1} =$ .....

(2) $\left(\sqrt{2}\right)^{2} \times \left(\sqrt{2}\right)^{4} =$ .....

(3) If $2^{2x-1} = 32$, then $x =$ .....

(4) The probability of the impossible event = ...

(5) The S.S. of : $x(x-1) = 0$ in $\mathbb{R}$ is .....

2 Choose the correct answer :

(1) Sixth the number : $2^{12} \times 3^{12}$ is .....

(a) 6^{2} (b) 6^{4} (c) 6^{11} (d) 6^{23}

(2) If $x = \frac{\sqrt{9}}{\sqrt{3}}$, then $x^{-1} =$ .....

(a) $\frac{\sqrt{3}}{3}$ (b) $\frac{\sqrt{3}}{\sqrt{2}}$ (c) $\sqrt{3}$ (d) 2

(3) If 2 is a solution of : $x^{2} - 5x + \ell = 0$, then $\ell =$ .....

(a) -3 (b) -6 (c) 3 (d) 6

(4) $5^{x-2} = 1$, then $x =$ .....

(a) 0 (b) 1 (c) 2 (d) 3

(5) $4^{3} + 4^{3} + 4^{3} + 4^{3} =$ .....

(a) 4^{3} (b) 4^{4} (c) 4^{12} (d) 4^{81}

3 Factorize : (1) $xy + 5y + 7x + 35$ (2) $x^{4} + 4y^{4}$

4 [a] Find in $\mathbb{R}$ the S.S. of : $x^{2} + 16 = 8x$

[b] Simplify : $\frac{4^{x+1} \times 9^{2+x}}{6^{2x}}$

5 [a] If $3^{x} = 27$, $4^{x+y} = 1$ **Find the value of :** x and y

[b] A bag contains 15 balls numbered from 1 to 15 , one ball is chosen randomly.

Find : (1) The probability that the number on the chosen ball is divisible by 3

(2) The probability that the number on the chosen ball is even number.

(3) The probability that the number on the chosen ball is prime number.

Additional question

[a] Complete :

(1) $5x^2 - 3xy - \ldots\ldots = (x - y)(\ldots\ldots + \ldots\ldots)$

(2) $\ldots\ldots - 64x^2 = (4 - \ldots\ldots)(4 + \ldots\ldots)$

[b] The area of a square is $(9x^2 + 30x + m)$ cm^2. Find the value of m (given that the side length of the square is a rational number) , then find its perimeter when $x = 2$

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General Mathematics Supervision

Answer the following questions :

1 **Choose the correct answer :**

(1) $(x + 3)^2 = \ldots\ldots$

(a) $x^2 + 9$ (b) $x^2 - 9$ (c) $x^2 + 6x + 9$ (d) $x^2 - 6x + 9$

(2) If $\left(\frac{5}{3}\right)^{x} = \frac{27}{125}$, then $x = \ldots\ldots$

(a) -5 (b) -3 (c) 2 (d) 5

(3) In a mixed school there are 320 students , if the probability that the ideal student is a boy equals 0.6 , then the number of girls of the school equals $\ldots\ldots$ girls.

(a) 256 (b) 192 (c) 128 (d) 196

(4) If $a + b = 5$, $a - b = 4$, then $b^2 - a^2 = \ldots\ldots$

(a) -20 (b) -1 (c) 9 (d) 20

(5) $(x + 1)^2 = 1$, then $x \in \ldots\ldots$

(a) $\{0, 2\}$ (b) $\{0, -2\}$ (c) $\{0\}$ (d) $\varnothing$

2 **Complete the following :**

(1) If the probability that a student succeeds in an exam is 0.85 , then the probability of his failure equals .....

(2) The greater number of $(-2)^{24}$ and $(-2)^{25}$ is .....

(3) If $2^{x} = 5$, then $2^{x+1} =$ .....

(4) $x(a+b) - y(a+b) = (a+b)$ .....

(5) If four times a number is 48 , then one third of this number is .....

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3 **[a] Factorize each of the following completely :**

(1) $ax - 4a + 3x - 12$ (2) $a^4 + 4b^4$

[b] Find in $\mathbb{R}$ the S.S. of the equation : $2x^3 = 18x$

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4 **[a] Simplify :** $\dfrac{4^n \times 6^{2n}}{2^{4n} \times 3^{2n}}$

[b] If $\left(\sqrt{3}\right)^{n+2} = 9$

Find the value of : n

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5 **[a]** Find the positive real number if we add its square to its three times the result will be 28

[b] One card is selected randomly from 8 cards numbered from 1 to 8

, find the probability of the following events :

(1) Getting a number divisible by 3

(2) Getting a number greater than or equal to 6

(3) Getting a prime number.

Additional question

[a] Choose the correct answer :

(1) If $b - a = 6$, then $a^2 - 2ab + b^2 =$ .....

(a) -36 (b) 36 (c) ± 36 (d) -12

(2) If $4x^2 - y^2 = 32$, $2x + y = 8$, then $4x - 2y =$ .....

(a) 4 (b) 6 (c) 16 (d) 8

[b] Factorize each of the following :

(1) $4x(3x + 7y) - 5y^2$ (2) $\frac{1}{8}a^3 - 8b^3$